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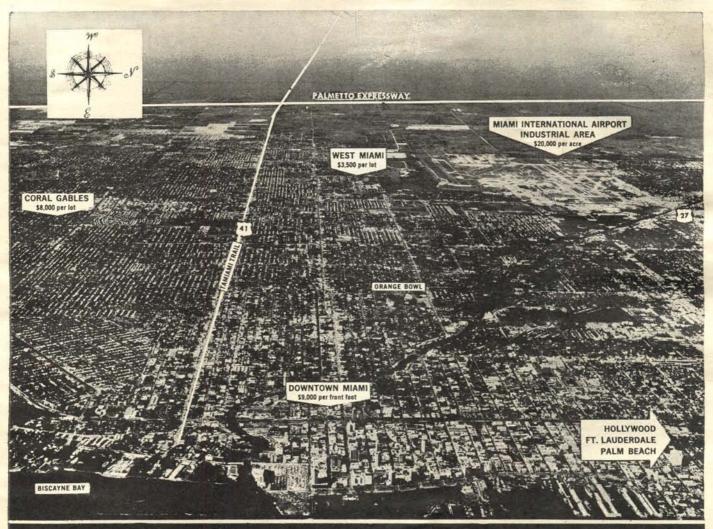
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WORKBENCH volume 20 number 1

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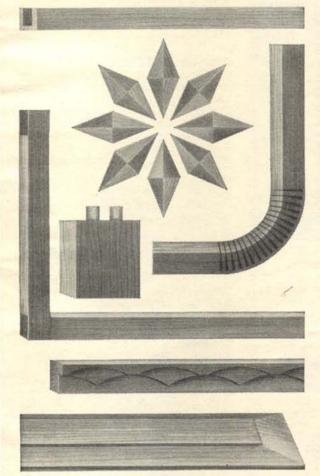
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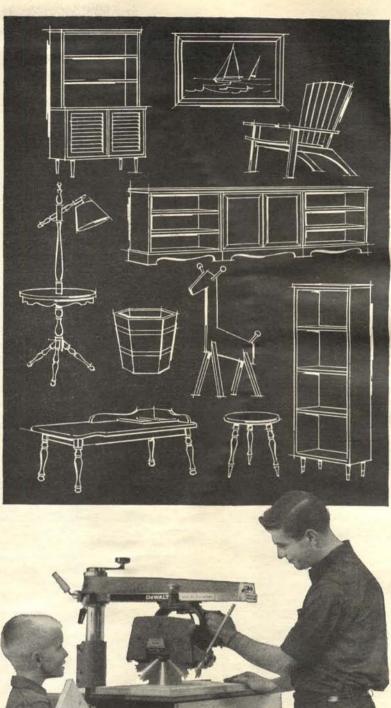
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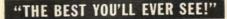




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Letters to the Editor

Dear Mr. Hedden:

Photo shows a lamp I made from an 8-point antler I found while hunting. Took quite a bit of perseverance to drill a hole down through the horn without breaking through. Had to add an extension on the socket end of the lamp to make it the right height for the shade. Perhaps no great skill was involved. but believe it is unusual.

Sidney E. Ward, Whitehall, Mont.



Dear Mr. Ward:

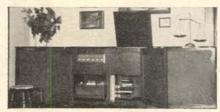
The lamp is most unusual, and there is craftsmanship involved when you drill a hole down through material like horn without breaking through.

Dear Mr. Hedden:

Enclosed are two snapshots of twin speaker cabinets and a component cabinet designed and built by my husband. One half the top of the cabinet opens to provide access to a Garrard record changer, the cabinet houses a Scott stereo amplifier and a VM tape recorder.

My husband has a library of WORKBENCH and referred to them while building our new home. Mrs. M. Nickelson, Farmington,

Minn.



Dear Mrs. Nickelson:

Your husband has done a magnificent job on the stereo and speaker cabinets. Sorry we cannot show the cabinet in color, as in your photo; the maple-stained cherry is truly beautiful.

Dear Mr. Hedden:

In the May-June issue there was a tip on removing a fish hook caught in clothing by opening the eve. I find the quickest way is to cut the hook with a pair of plierswhich should be in every tackle box -and removing the two pieces.

Milton Collman, Watertown, Wis.

Dear Mr. Collman:

Thanks for the tip about the fish hook problem. Yes, every fisherman should have a pair of good pliers in his tackle box, and a firstaid kit as well.

Dear Mr. Hedden:

Enjoy reading WORKBENCH Very much, and have noticed that a number of your readers have made grandfather clocks. Am sending a photo of one of the several I have made. Also shown are two violins I have made.

M. A. Nichols, Potsdam, New York.



Dear Mr. Nichols:

Your clock designs are most unusual, and show excellent craftsmanship. We have had requests for plans for making a violin and will have complete plans in a future issue.

Dear Mr. Hedden:

Saw a tip in one of the back issues about using a hacksaw blade to cut off a dowel just above the surface of the work. I use a scrap of cardboard with a hole punched in; slip it down over the dowel. The cardboard prevents the blade from marring the surface.

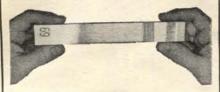
R. R. Humphries, Covington, Va.

Dear Mr. Humphries:

Our thanks; we are passing the tip on to our readers.



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PREE LITERATURE P.O. Box 377 W
COLONIAL WORKSHOP West Sacramento, Calif.

Dear Mr. Hedden:

The hyperbolic-paraboloid patio roof in the July-August issue was just the unique cover I wanted for my patio. I enlarged it to 18 x 24 ft. and added two more posts, as you can see in the photo. I also used 2 x 6s to enclose the 4 x 4 posts to provide a more balanced appearance. I am very happy with the results of this project.

Edward Forsek, Brookfield, Ill.



Dear Mr. Forsek:

A number of readers have told us they have built, or are building the paraboloid patio roof, but yours is the first photo we have received. We certainly agree the result is great, and your changes have improved the appearance, as well as the area covered.

Dear Mr. Hedden:

Been getting the WORKBENCH for some time and enjoy it very much. Got interested in making spinning wheels that work, and have sold a number. My customers now want my wife to teach them to spin, and so we need carders to comb the wool for spinning. My wife got hers several years ago, and we do not know of a present source for such items.

Am enclosing a snapshot of my wife at the spinning wheel.

J. E. Thompson, Vista, Calif.



Dear Mr. Thompson:

For a youngster of 75 you certainly keep busy. Spinning and weaving are becoming very popular hobbies, and there are clubs devoted to these crafts. For supplies for spinning wheels, contact Anthony Cardarelle, 3012 Adeline St., Berkeley 3, Calif.

Dear Mr. Hedden:

On the Sept.-Oct., 1963 cover would like to know about the picture over the desk. Is that ship a paint-by-number, a lithograph or what?

C. H. B., New Jersey

Dear Mr. C. H. B .:

The source of all items in the cover photo, except that picture, were given in the article. The picture was painted by a member of the crew of that destroyer during World War II. A few hundred prints were made from the painting, all being sold to members of the ship's crew. The original must still be in the possession of the artist. His name was Eisenberg, and the last we knew he was working as an artist for one of the Boston newspapers.

Dear Mr. Hedden:

Am enclosing a picture of two grandmother clocks I have built this year. I ordered the plans from Craft Products, but modified them some to suit myself. One is made of walnut, the other cherry. They are finished with oil and beeswax. Woodworking is a lifetime hobby; work for the Post Office, but spend all my spare time in my shop. Lynn Hazlewood, Humboldt, Tenn.



Dear Mr. Hazlewood:

You did a beautiful job, and your ten and twelve-year-old daughters will have real prizes for their homes when they grow up and get married.

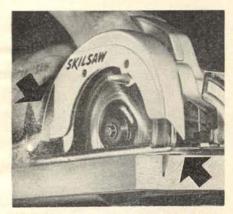
CORRECTION

In Nov.-Dec., 1963 issue, in the Modern Sofa: Detail A (Back-Frame Assembly), the hardwood spacer should measure 34" x 55%"-x 4½"; the 18%" is incorrect.

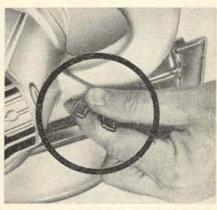
In Section F-F, the upper member should be 1-3/16", not 1-13/16".

Jay W. Hedden

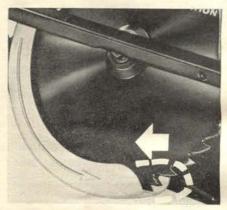
6 REASONS WHY SKILSAW POWER SAWS OUTSELL EVERY OTHER MAKE!



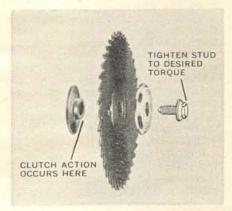
Exclusive sawdust ejection-Special air stream ejection system directs sawdust down to floor, away from the operator; blows it off the line of cut.



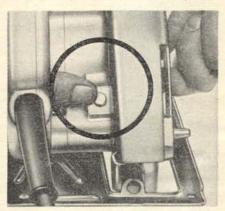
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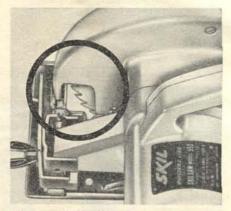
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Skilsaw Power Saws have a full range of blade sizes from $5\frac{1}{2}$ " to $8\frac{1}{4}$ ". See them at your nearby lumber and hardware store. Prices start under \$30. Slightly higher in Canada.

*available on heavy-duty models only

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HOW TO FINISH WOOD

Get this 32-page book, written by experts. Tells how to obtain professional finish on interior and exterior natural wood. Floors, wall paneling, antiques, boats, many more. Only 25 cents p.p. Send coin today.

McCLOSKEY VARNISH COMPANY Dept. W. 7600 State Road, Philadelphia 36, Pa.

PAINTING **GALVANIZED STEEL**

Extensive tests have proved that it is easy to paint galvanized steel. The only problem is to select the correct type of paint. As a homeowner, if you have painted galvanized rain gutters and downspouts, or any other zinc-coated-metal items, you are aware of how often ordinary house paints simply scale off the metal.

Researchers at three different laboratories have concluded a twoyear study in which they exposed 972 galvanized-steel test panels painted with 47 different kinds of paint. Their findings were that: 1. Conventional zinc-dust paints gave the best results. 2. Cement-in-oil paints also were excellent. 3. Latex paints compounded specifically for use on galvanized steel showed highly promising results. 4. Most proprietary paints specifically compounded for galvanized steel proved satisfactory.

The first study of its kind ever made, the paint research was conducted under the sponsorship of the Committee of Galvanized Sheet Producers of the American Iron and Steel Institute.

According to Walter O. Zervas, research engineer of the Committee, the research on the available paints was undertaken because of the rapidly increasing use of galvanized steel, and the lack of reliable information regarding the types of paints that were most suitable to use on the coated steel.

In addition to determining the best type of paints to use, the research disclosed the fact that the chemical treatment of galvanized steel by mills to prevent "wetstorage stain" has so little effect on paint adhesion as to be negligible. Weathering of galvanized steel is not necessary to assure good paint adhesion when the correct type of paint is used.

Research scientists rated all of the paints tested on a scale that ran from zero to ten, with ten representing "excellent to almost perfect adhesion", and zero representing a paint that has almost no resistance to being removed from galvanized metal, or that peels off the metal by itself. Using this scale, three classes of paints were determined as being the best for painting galvanized metal, and were rated as follows:

Zinc-dust paints had an average rating of 9.6. Pigment in these

paints normally runs 80 per cent zinc dust and 20 per cent zinc oxide by weight, with some modifications, depending on color. Vehicles are generally drying oils or alkyd varnishes. For underwater or wet conditions, phenolic varnish is needed.

Portland cement-in-oil paints had an average rating of 8.9. Portland cement is part of the pigment. Formulations vary, but the composition usually is 60 per cent pigment, 40 per cent vehicle. (These paints should not be confused with cementbase water paints, which are entirely different and were not included in this study.)

Proprietary paints ranged from a low of 0.4 to a high of 9.7, with an average of 7.5. Formulations for these paints, and the reasons for their success or failure, are not generally known, as they are specialty products of various paint companies. However, among the good performers are certain recently developed proprietary paints that are known to be based on latex emulsions, both polyvinyl acetate and acrylic.

Further research showed that a top-quality paint did a better job than cheaper formulations. This is pretty much true for all types o paints; the galvanizing simply presenting a more severe test for the quality of the coating. It also was determined that two coats of paint, whether the second one was applied immediately after the first coat had dried, or a year later, were better than a single coat.

Zinc-dust paints are preferred, and they are easily top-coated with regular paint to provide a colored finish to match or contrast as desired. While cement-base paints do extremely well as low-cost, one-coat colored finishes, they do have some tendency to chalk. Proper formulation and manufacture of these paints, therefore, is important. Buy top-quality products from reputable manufacturers. While proprietary paints rated well, they did show wide variance in adherence, even though specifically recommended by the paint manufacturer for use on galvanized steel. They would be the last choice for painting on galvanized metal. A sub-group of latexbase proprietary paints especially formulated for galvanized steel averaged a 9.2 on the scale and are well suited for one-coat colored finishes. \triangle \triangle



Weller Dual Heat Soldering Gun

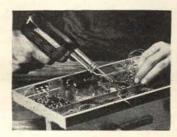
There's no tool like a Weller Dual Heat Gun for quick, easy soldering and scores of household repairs. Pull the trigger—tip heats instantly and spotlight illuminates work. 2 trigger positions give you a choice of two tip temperatures. You can switch instantly to the heat best suited for the job. And by using high heat only when necessary, you prolong tip life.

Tip is made of copper for superior heat transfer and premium-plated for rigidity and long life. Accessory tips

are available for heat sealing, cutting and smoothing.

Over 5 million Weller guns have been sold. They're used by professional servicemen and homecrafters the world over. All Weller guns are UL approved and guaranteed one year against defects in material and workmanship.

Weller dual heat guns are available in many models with wattage ratings to suit your needs. They are also supplied in plastic case kits that include accessories.



A must for hi-fi kit building. Assures noise-free connections. Use low heat when soldering near sensitive components, high heat for chassis connections.



Saves on electrical repairs. Enables you to do many appliance and electrical repair jobs yourself. Also useful for many different crafts and hobbies.



Mends metal. Whether patching holes, sealing seams or joining metal parts, your Weller gun will pay for itself on scores of repair jobs around your home.



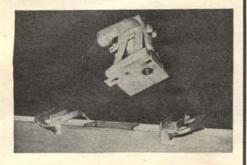
Does more than soldering. With cutting and smoothing tips you can cut plastic tile, repair plastic toys, seal plastic bags, repair furniture dents, etc.

WELLER ELECTRIC CORP., 601 STONE'S CROSSING ROAD, EASTON, PA.



Split Image Transit

Makes bubble and string levels obsolete. One man can perform any leveling or incline job with the amazingly accurate Split Image Transit. It indicates level and measures a minimum of ½" rise or fall every 25 feet. Patio layout, bricklaying, flooring, surveying, fencing, plumbing, shelving, guttering, drainage—all are easy with Split Image Transit. Postage pd. \$6.59 ea.—\$10.50 with attractive leatherette carrying case. Hopkins Mfg. Corp., Emporia, Kansas.

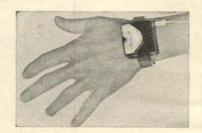


Router Attachment & Router Bit

For most ¼" Electric Drills. Routes recess for hinges in wooden doors and frames in minutes and performs many other workshop jobs. Assembly includes H.S. Steel Cutter, two Side Guides, Instruction Sheet, and Assembly Handware. All parts cadmium plated. Price \$4.98 postpaid. If not satisfied return postpaid within 10 days for refund. DeSan Mfg. Co., Dept. WB., 10330 Seaton Drive, St. Louis 37, Missouri.

Shoppers'

SHADES OF DICK TRACY: This 2-transistor, 1-diode receiver is held on your wrist by a stainless-steel stretch band, operates on two hearing-aid batteries. Radio has station selector, no volume control, is turned on by plugging in magnetic earphone. For local reception only. Receiver is compact, measuring $3/4 \times 11/2 \times 13/4$ in., is just \$6.95 from Davenport and Waldon, 2124 Sepulveda Blvd., Los Angeles 28, Calif.



INDUSTRIALLY-RATED sander-polisher has two speeds electronically-controlled to suit the work. At 3,400 r.p.m. Wen Model 940 provides fast results on sanding jobs, removing heavy paint, resurfacing cabinets, doors, etc. When speed is reduced to 1,800 r.p.m. tool efficiently buffs, waxes and polishes with little chance of burning the finish. Model 940 weighs just 7 lbs., costs \$44.95 wherever Wen tools are sold.



UNUSUAL IN DESIGN are the new Model 7800, 7/8 H.P. and Model 7900, 11/4 H.P. portable routers from Millers Falls. Both are engineered for heavy-duty use, feature momentary-contact, double-pole trigger switches and handy spindle lock for easy cutter change. Model 7800 is \$74.50, the 7900 is \$84.50, both covered by the new Lifetime Guarantee. Made by Millers Falls, Greenfield, Mass. Ask for demonstration at nearest Millers Falls dealer.



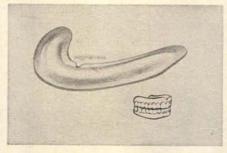
"PUSH-BUTTON" PATCHING is possible with new pressure can that has two instant-change nozzles. One is needle-nose for fine-line jobs, the other is flat-nose nozzle that releases a wide bead of material for bigger repair jobs. DAP Spackling is creamy-paste patching material that dries white, can be painted almost immediately. Available at paint, hardware and lumber dealers. From DAP, Inc., Dayton, Ohio.





Hanging Garden . . . \$1.49

For a lovely greenhouse of living color send for these 5 fast growing Madeira Bulbs (Boussingaultia Basselloides). Planted in attractive hanging basket. Masses of heart-shaped leaves with small gay white fragrant flowers. Complete with bracket, ready to hang \$1.49, 2 for \$2.89. C.O.D. postage extra. Cash orders add 35¢ shipped ppd. Satisfaction guaranteed. Michigan Bulb Co. Dept. FA-1608, Grand Rapids 2, Mich.



New False Teeth Comfort

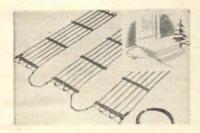
Sealtite Dental Cushions provide new, patented live-action comfort for denture wearers. Cushions mold perfectly to ridges and low spots in plates, give soothing protection to sore gums. Eat anything with complete ease. No chance for embarrassment when you sneeze, cough, laugh. 15 lowers or 12 uppers, \$1.00 plus 25¢ for postage. Sealtite Div., Piper Brace Sales Corp., Dept. WB-14D, 811 Wyandotte, Kansas City 5, Mo.

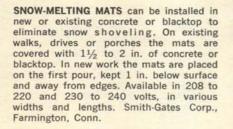


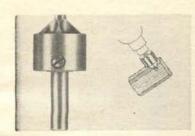
Never Pin A Diaper Again!

Change now to new, no-fold Snap-on Diapers. Cuts diapering time ½! Two snaps and they're on. So fast, so safe. No pins to stick you or baby. Adjustable—fits any baby up to 24 months. Made of soft, strong, absorbent cotton. Specify color: White, Blue, Pink, Yellow. \$3.75 postpaid per half doz. Guaranteed — money back if returned postpaid in 30 days. Nel-King Products, Department WB-14DP, 811 Wyandotte, Kansas City, Missouri 64105.

Showcase



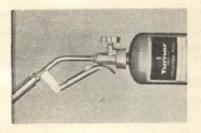




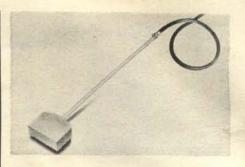
FIRST TOOL ever designed for corner beveling with an ordinary electric drill motor, including almost all ½-in. drill motors, this handy bevel cutter adjusts 1/32 to 5/16 in. width of bevel with simple setscrew change. Dual guides on the tool assure accurate 45-deg, bevels along entire length and width of workpiece. Cuts wood, plastics, soft metals. Price is \$1.98 from Arco Tools, Inc., Dept. WBP, 421 W. 203 St., New York 34, New York.



ONE OF THE SMALLEST, yet most practical devices we have ever seen, this versatile clip will hold almost any small container on a wall. It will grip glass jars, metal coffee cans, regular "tin" cans, small paint jars, even tubes of glue and small tools. The claim is that Glen Clip will hang 95 per cent of all jars and cans; we are inclined to believe. For nearest dealer write: Cassell Craft, 67 Vine Hill Rd., W. Hartford, Conn.



ATTACHED AUTOMATIC LIGHTER is feature of new Turner Torch. Called the "Pivot Pilot," the lighter works on regular cigarette-lighter flints. To ignite the torch the lighter is flipped up into position and a turn of the spark wheel ignites the torch. Once the torch is lit, the lighter pivots down out of the way, and in no way interferes with torch use. For the name of your nearest dealer, write Turner Torch Corp., Sycamore, Ill. 60178



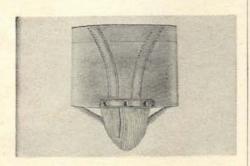
Dew Boy

Dew Boy attaches to your hose for washing of cars, houses, boats, trailers. When sponge is pressed against the surface to be washed—water flows through the valve inside the sponge. When Dew Boy is lifted from the washing surface water flow stops and saves water. Also handy for washing walls, ceilings, cabinets, floors, windows, sinks and bath tubs. Postage paid. \$1.95 ea—3/\$4.65—6/\$8.10. Send orders: Hopkins Mfg., Emporia, Kansas.



Septic Tank Trouble?

Northel Reactivator works to keep septic tank and cesspool clean. A bacterial concentrate breaks up solids and grease—works to prevent overflow, back-up, odors. Regular use can save costly pumping or digging. Simply mix dry powder in water, flush down toilet. Non-poisonous, non-caustic. Guaranteed to reactivate septic tank, cesspool. Six months' supply (23 ozs.) only \$2.95 postpaid. Northel Distributors, WM-1, P.O. Box 1103, Minneapolis 40, Minn.



Sagging Stomach?

Appear inches slimmer in your Pi Peer Slim-R. Broad, powerful elastic belt pulls in sagging stomach muscles, helps relieve minor aches and pains caused by backstrain. Detachable pouch gives extra lift many men want. Completely washable. \$4.98 postpaid. Send hip measure. Thousands of men are wearing it! Satisfaction guaranteed or money back if returned postpaid in 30 days. Piper Brace Company, Dept. WB-14R, 811 Wyandotte, Kansas City, Mo. 64105.



Lure Fish By Smell

New Getzem is fortified with Qumox hormone attractant and concentrated food odors fish love. One tube catches dozens of fish. Not an oil that stays on surface. Instead, it disperses, penetrates deep into water. Legal in every state. Only \$1.25 per tube (3 for \$2.95). Indicate choice: Trout. Cat. Carp. Other fresh water. Salmon. Other salt water. Norkin Laboratories, Dept. WB-14N, 809 Wyandotte, Kansas City, Mo.



New Nel-King Wallpaper Remover

No expensive steaming, no tiresome scraping. Mix 2 ozs. in a gallon of water. Apply with rag, brush, sponge or spray. Penetrates, loosens adhesive, paper "skins off" in minutes. Works on several layers of paper and painted-over wall paper, too! Safe. Only 98¢ plus 25¢ handling, for 6 oz. bottle; Pint \$2.49 postpaid. Guaranteed. Money back if returned postpaid in 30 days. Nel-King Prod., Dept. WB-14K, 811 Wyandotte, Kansas City 5, Mo.



Ro-Boat Assembly Kit

A Ro-Boat Kit is the perfect workshop project—the ideal gift for adults and children. Ro-Boat carries 300 lbs. and uses a 2 hp. motor for fishing or hunting. Children love it for swimming fun. Frame work, fittings, screws, bolts and plans arrive ready to assemble. All you need supply is a 4 x 8 piece of plywood and 3 inner tubes. Postage paid—one kit: \$7.95; 2 kits: \$13.95; 3 kits: \$19.50. Send orders: Hopkins Mfg. Corp., Emporia, Kansas.



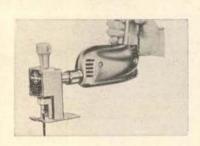
Princess Beauty Belt

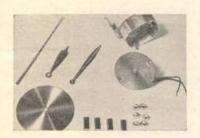
Slim your appearance . . relieve backstrain. New, non-slip Princess Beauty Belt relieves strain on tired back muscles. Makes you appear inches slimmer. Weighs just 4 ozs. Adjusts in seconds. Foam rubber back pad. \$4.98 ppd. Give hip measure. Hip sizes 46-50, \$1.00 extra. Removable long garter attachments—69¢ for set of four. 30-day money-back guarantee. NEL-KING Products, Dept. WB-14L, 811 Wyandotte, Kansas City 5, Mo.

SHOPPERS' SHOWCASE









RADIAL-ARM SAW PLANER fits directly on saw arbor, will fit any size from ½ to 1 in. Designed to operate at 3,000 to 6,000 r.p.m., unit with high-speed cutters will make up to ¾-in.-deep cut in solid stock or plywood. Included with planer are grinding wheel and arbor to sharpen cutters of planer. Price is \$14.95; give make of radial-arm saw so proper unit can be sent. Gilmore Pattern Works, 1164 N. Utica, Tulsa 10, Okla.

KNIVES IN A JOINTER-PLANER head are set with this tool, not simply gauged after setting. One magnet holds the tool on the rear table, the front table then is lowered so the knife-locking screws are accessible. A second magnet draws each knife to position. Magna-Set Model J-7 for setting the knives in most four, six, eight and 12-in. jointer-planers is \$6.50. If not at your hardware store, write: Magna-Set Co., 632 New Haven Ave., Milford, Conn.

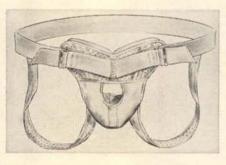
HANDY JIG SAW ATTACHMENT fits any 1/4-in. drill motor, is budget-priced for the craftsman who must watch his spending. The price is just \$6.95 ppd. for Jig-Saw Attachment No. 510 that does work of Jig, keyhole, coping, rip, crosscut, band and hacksaw. Cuts intricate patterns in wood, plastic, metal, makes own starting hole. Attaches easily to any make 1/4-in. drill, From Arco Tools, Inc., 421 W. 203 St., New York, New York,

KIT PERMITS BUILDING attractive clock right in a wall, whether it is of paneling or drywall construction. Included in kit are instructions, full-size drawings, electric clock movement, brass faceplate, hour, minute and second hands, 12 brass markers, outlet box and all necessary supports. Price of kit is \$9.00 plus postage for 3 lbs. from Gaston Finishes, P. O. Box 1246, Bloomington, Ind. Also ask for interesting catalog of finishes.



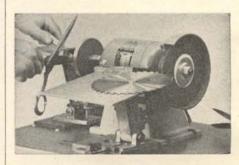
Stop Stooping

Amazing, new Pi Peer Shoulder Brace corrects posture instantly, comfortably. Provides even, distributed support for sagging shoulders. No fitting. Made of ventilated-for-comfort 3-ply material. Arm bands softly padded. Lightweight, cool. Patent pending. Can't be detected under light clothing. Give measurement around chest. For men, women. Only \$4.95 postpaid. Piper Brace, Dept. WB-14H, 811 Wyandotte, Kansas City 5, Mo.



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Now—Two-way rupture relief. You can enjoy the relief and comfort of a new truss design for reducible inguinal hernia combined with the added ease and security of a cool, comfortable suspensory. Flat foam rubber pad shaped to fit snugly under abdominal bulge. Elastic body belt. Send hip measurement. Only \$6.98 postpaid. Satisfaction guaranteed or money back if returned ppd. in 30 days. Kinlen Co., Dept. WB-14T, 809 Wyandotte, Kansas City 5, Mo.



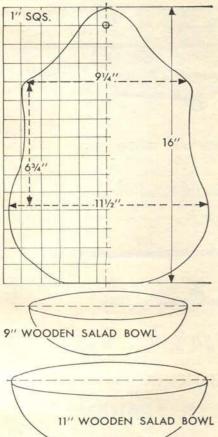
Sharpener Turns Time Into Cash

Make as much as \$6.00 per hour part or full time. Sharpen knives, scissors, pinking shears, saws, clippers, planer blades and tools for neighbors, stores, hospitals, barbers, etc. Turn out professional hollowground work. Thousands in use, be your own boss! Complete manual, signs, etc. to help you. \$34.95 factory-to-you. Write for free booklet, "The Turning Point in Your Life." Treyco Products, 384 Old Falls Blvd., N. Tonawanda, N. Y.



SALAD-BOWI B. G. AHEARN

Simple to make, but attractive and useful, here is a project that would be fine for a group to make and assemble. The backboard is cut from % or ½-in. plywood, using a pattern enlarged from the squared drawing, and doubled. Two wooden salad bowls of 9 and 11-in. size are cut in half, thus make two of the planters. Varnish or shellac the boards before attaching the bowl halves. They are attached by driving screws through the board from the back. If soil is to be used in the bowls, paint the insides with asphaltum. \triangle \triangle



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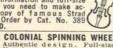
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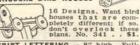
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New! XMAS LAWN CUTOUTS Western Sant Cowboys, Full-si patterns (48 tall), No. 395 51.50.

Latest fashions in wall decor. All patterns full-size. No. 342 . . \$1.00. 16 WHATNOT SHELVES UNUSUAL BIRD HOUSES



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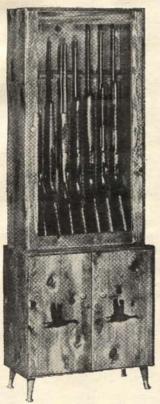




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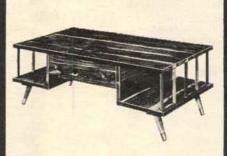
GUN CABINET No. 707

The knotty pine "Pioneer" gun cabinet holds eight guns. Bottom storage compartments for ammunition and other equipment equipmed with two locks. Brass ferrules on legs. Overall size 27" wide, 15½" deep, 83" high. Glass for door not included.



GUN RACK No. 404

This four gun rack with full width drawer for ammunition and cleaning gear is all cedar. Complete; ready to assemble, screws, brass pulls and safety lock included. 32" high, 211/2" wide.



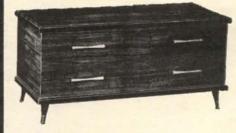
COCKTAIL TABLE No. M

Top 20" x 44". Stands 15" high. Has useful drawer with plywood bottom. Brass pulls.



GENUINE CEDAR CHEST No. 909

The "Astronaut" with simulated drawers and brass pulls has a handsome modernistic style. Cedar legs have brass ferrules. Size 20" wide, 46½" long, 21" high. Five ply top and front.



ORIENTAL WOOD CHEST No. 551

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Box M

Huntsville, Alabama

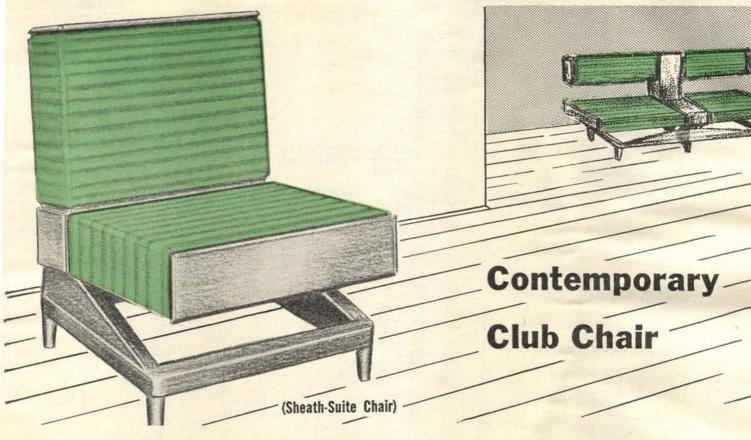
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BOX M HUNTSVILLE, ALABAMA



Companion piece to the sofa shown in the last issue, this club chair is built in much the same manner. It too has "sheath" upholstery that is held in place with elastic in the hems of the covers that fit on the seat and the back.

Start construction by cutting the pieces and assembling the basic frame, shown in the center of Fig. 2. Note that Parts 10, the sides of the back must be made as a pair. Place the 1% x 3% x 26%-in. hardwood pieces edge to edge and mark them. The side members of the seat, Part 6, also are a pair. Glue and clamp together Parts 6, 7, 8 and 10 and set aside until the glue has set. Then drill and countersink through Part 7 for six No. 10 screws 134 in. long. Drill through Parts 8 and 10 for 1/2-in. flathead stove bolts 4½ in. long. The holes will, of course, also go through Part 6. Join the two assemblies with Parts 1, 2, 5 and 9, using glue and flathead wood screws 2 in. long, countersinking all of them. Note that three Part 1 pieces are required. They can be drilled together for the No. 10 screws. Parts 3 and 4 are coated with glue on joining faces, then are glued and screwed to the assembly as indicated, using 2-in. screws of No. 10 size. Attach glue block 11. All screws are flathead and are countersunk flush. The tacking strip, Part 5, now is attached.

In Fig. 3 are shown the four frames on which the two sheaths

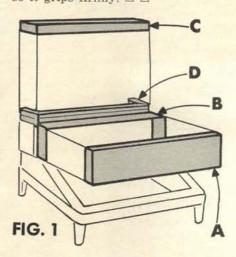
are held by elastic bands. Each of the frames is lettered, and the corresponding letters in Fig. 1 and the small sketch at the bottom center of Fig. 2 show their locations on the frame assembly. Note that two of the frames have caps; A at the front, and C at the top of the back. Each of the frames is mitered and glued, then attached to the basic frame with No. 16 flathead screws 3 in. long. Before making the frames, better check your basicframe dimensions. If your frame is slightly wider or narrower than the dimensions given, adjust the frame dimensions accordingly.

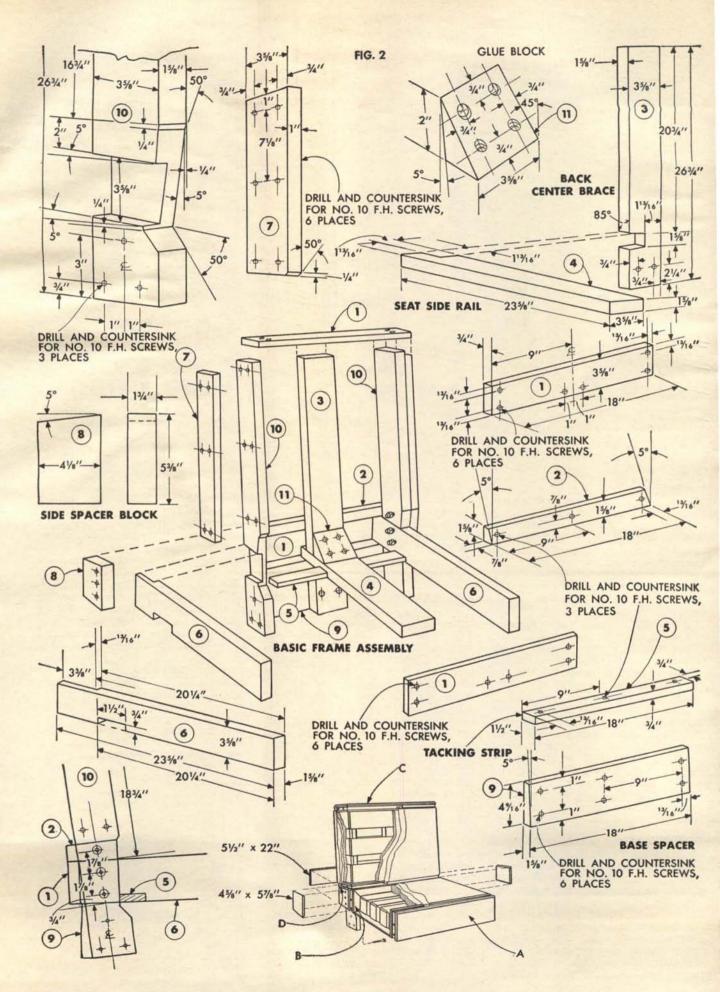
In Fig. 3 is described the base for the chair. The various pieces are cut, shaped, then joined with glue. You may prefer to use a dowel joint, rather than the mortise and tenon shown. Also, for added strength triangular glue blocks can be screwed inside each corner of the base.

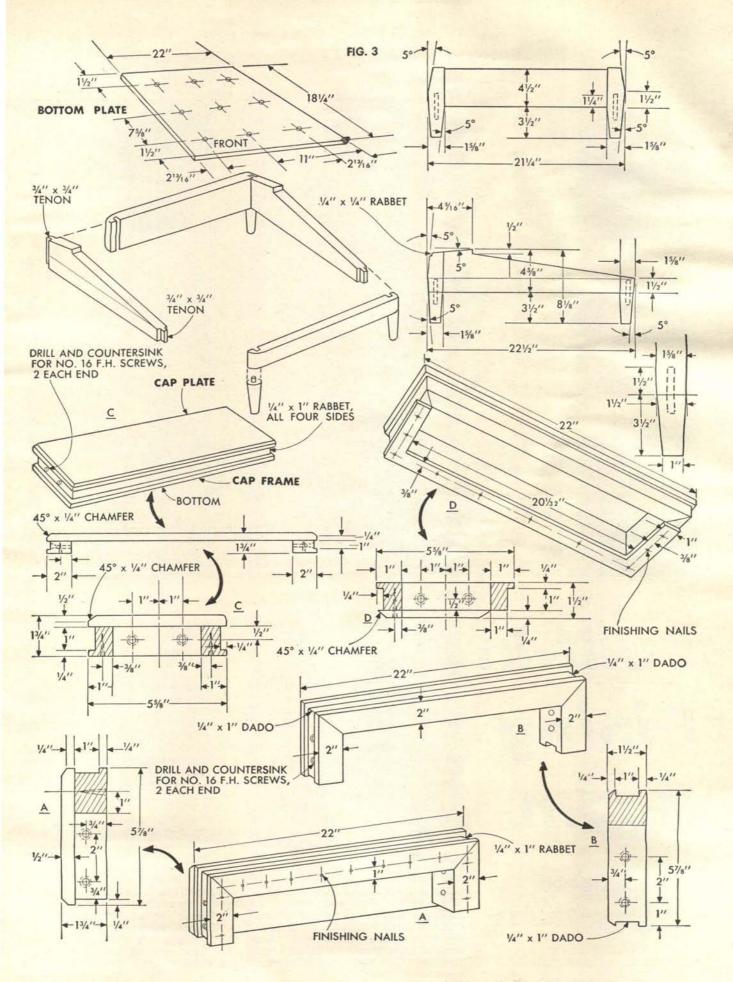
At this point you may wish to attach the base to the chair frame, or you may wish to first upholster the chair. The base is attached by driving three ¼ x 2¾-in. lag screws through each Part 10 member into the base, and two ¼ x 3½-in. lag screws through Part 3.

Tack each webbing strip with four \(^3\)-in. webbing tacks, wrap the webbing around the frame and stretch it with a webbing stretcher. Fasten the other end with four more tacks. After all webbing is on, attach the bottom plate, upper, lefthand, Fig. 3.

Cushions for the chair are foam rubber or urethane. The 2-in. seat cushion measures 18 in, back to front and is 22 in. wide. The extra 4 in. goes over cushions on each edge measuring 35% x 18 in. Two cushions 1-in. thick, measuring 15 x 22 in. are spot glued to the webbing on the front and rear of the seat back. Two 1-in. strips measuring 35% x 15 in. are fitted to the edges of the back. Muslin covers are made for the cushions, each having a 1/2-in. hem. The upholstery sheaths are made with %-in. hems, the elastic bands being 4 in. shorter than the perimeter of the chair end so it grips firmly. \triangle \triangle









Built-In Dining Room

R. J. DeCRISTOFORO

(With the cooperaton of Western Pine Association)

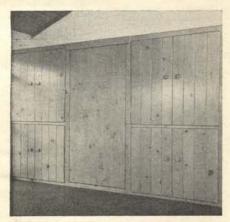
(PHOTOS BY EYMANN)

This king of built-ins is a complete dining room in a wall of cabinets. There is even a special cabinet for storage of folding chairs. To "put away" the dining room, all you do is close the cabinet doors and push up the table, which then becomes the center panel of what appears to be a paneled wall, Fig. 1. Your interpretation of the project can be completely flexible, as the swingout table can be incorporated in almost any type built-in of your own design, or made in its own case for use in any room. Thus, it can be a worktable in a family room, a cutting table in a sewing room, and so on. There is ample room in the table case itself, (when the table is up), so that shelves and cabinets could be installed for storage.

If you incorporate the table in an attached built-in, work with a level, rather than a square, Fig. 2. House walls seldom are plumb and the corners seldom are square. Use of a square will cause duplications of misalignments in the house structure. Use of a level will assure true verticals and horizontals.

The minimum height of a unit that incorporates the table as shown is 86 in., Fig. 3. It can be higher; a floor-to-ceiling unit—normally about 8 ft.—is fine. The total width of the cabinet is optional and will depend on the space available and the plans for the unit. The one shown is almost 12 ft. wide. The table-case width, Fig. 3, is the width of the door plus the thickness of the track and the case material. Allowing just a little for clearance, the case width for a 36-in. door would be about 39%-in.

Note in Fig. 3 that a safety lock is suggested for the door. This is just a ¼-in. hole drilled through the case and into the door edge. A ¼-in. rod is bent as shown and used as a pin. We used a closet-door type "snugger" to keep the table in its vertical position and this proved sufficient; the safety lock is there to prevent children from using the table as a plaything. Lowering the door requires only that you grasp the bottom edge of the door and



1. When the meal is finished, the dining room "disappears" into a wall of cabinets, becomes a large panel.



2. It is wise to work with a level when building against existing house walls; they are never square or plumb.

pull out until the table is horizontal. To raise the table you push down on the outboard end and walk toward the wall until the snugger grips the door shut.

In either a built-in or an individual case, it is a good idea to elevate the floor of the table case. We used 1½ x 1½-in. stock, Fig. 4, with ¾-in. plywood as the floor. Keep the table case square and true during construction by nailing strips across the opening, Fig. 5.

Fig. 6 shows in detail how the table functions. An important dimension is the 4 in. from track centerline to the door facing. This was for a door 2 in, thick. If you use a thinner door, then reduce the dimension accordingly. The advantage of the 2-in. door-other than visual appeal-is that it permits buying a salvage door at a reasonable price, then covering it with a 1/4-in. panel. Detail B in Fig. 6 shows how a "cornice" is used to conceal the gap between the table top and the upper edge of the cabinet. Fig. A is a section through the track, filler and front framing. The groove in the track should be just wide enough

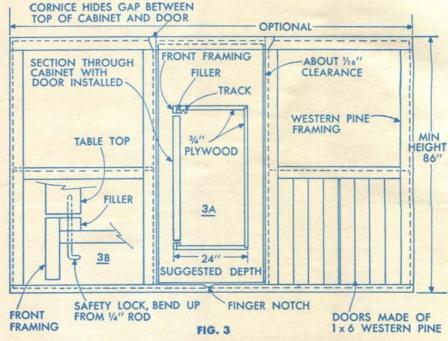
for the bearing diameter and deep enough to accommodate the bearing thickness, plus the head of the bolt used to hold the bearing.

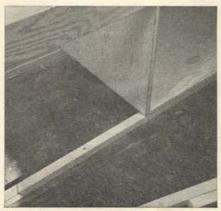
The top surface of the light box, Fig. 13, aligns with the table top. The box illuminates the recess that provides an area for decorating the table without stealing space from the table. Two 60-watt bulbs under frosted glass are sufficient to provide a "candlelight" atmosphere. Fig. 7 shows the complete rockerarm assembly. Most of this can be hidden by a table cloth, and only an extremely tall person will bump it with his knees.

The best procedure, once the table has been selected and is ready, is to assemble and attach the bearing-support assembly, Fig. 8. The selection of a bearing is not critical; you could even use a couple of roller-skate wheels, so long as you de-

signed the track accordingly. However, the location of the bearing is important, for this determines the distance from the face of the door to the track centerline. Once the assembly is made, attach it securely to the door with glue and screws. Be sure the screws enter the solid frame of the hollow-core door. The maple block, Detail A, Fig. 8, is used as a stop to establish the table height at that end. It is sized to fit the track and installed with a single screw after the table is in place.

Fig. 9 gives the details of the rocker asembly. Best bet is to start by attaching the cleat, No. 10, to the door, then making and attaching the two upper-pivot blocks. Next, make the lower-pivot assembly that consists of Parts 13 and 14. Drill the holes for the pivot rod before assembling the parts with glue

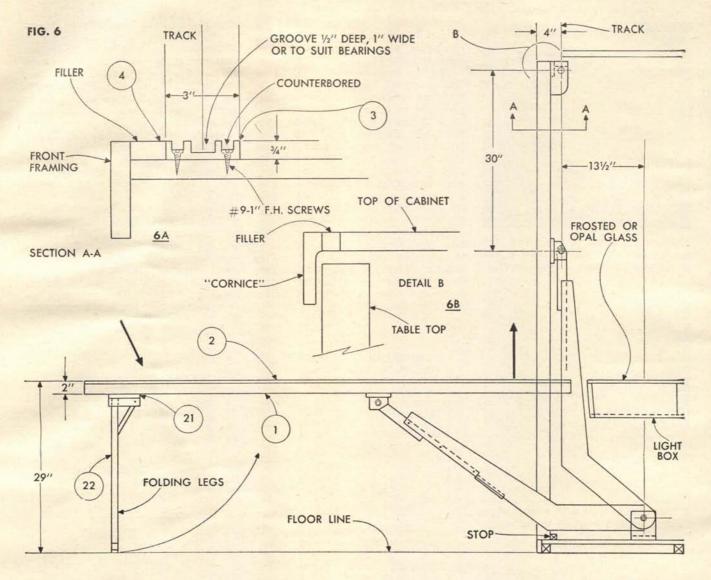




4. Start construction by attaching 1½ x 1½-in. stock to the floor. Use ¾-plywood for cabinet "floor."



5. To keep case of table cabinet square during construction, tack-nail strips across sides, as here.



and nails. Next, work on Parts 17 and 18. A critical step here is drilling the holes for the upper-pivot rod. If you use a drill press, this is not too difficult, but when using a brace or portable drill, be careful to keep the holes straight and square.

Now, shape the rocker arms. You can work from the squared drawing in Fig. 9, duplicating it full-size on paper or directly on the wood. Be sure to tack-nail together stock for both arms so they can be cut and drilled at the same time. Sand all edges smooth and attach with glue and screws to the pivot-arm extension. Next, cut to length the pivot rods. These 1/2-in. steel rods can be purchased in most hardware stores in 36-in. lengths. The locking collars are standard items from the tool department of Sears-Roebuck. With these parts ready, cut and rabbet the two pine braces, No. 20, and attach with glue and nails.

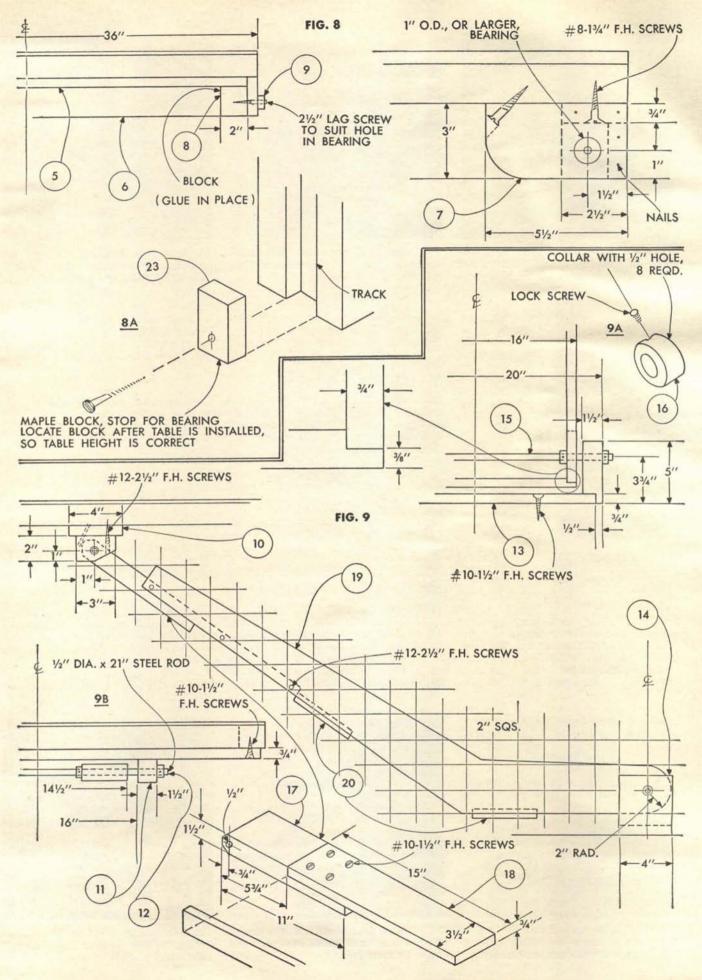
Slip the upper pivot through the upper-pivot block and the rocker arms and secure the locking collars as shown in Detail B, Fig. 9 and in

Fig. 10. Be sure to center the rocker-arm assembly between the two pivot blocks. Follow the same procedure to attach the lower-pivot assembly as shown in Detail A in Fig. 9 and Fig. 11. This completes the rocker-arm assembly and the table now is ready to be set in place.

Install the tracks carefully, holding them in place temporarily with clamps, until you have measured and leveled to make sure they are accurately positioned and absolutely plumb. With an assistant, place the table flat on the floor in front of the unit, then lift the inboard end so the bearings are set in the tracks. Drive a couple of small nails into the track as temporary stops to hold the table up at the end. Best bet now is to raise the table to a vertical position while someone stays inside the case-there is plenty of room-to mark the exact location of the lower-pivot assembly. Then the table can be lowered and the lower-pivot assembly tack-nailed in place. This will permit raising and lowering the table a few times to make sure it is properly positioned. Rest the outboard end of the table on a chair and some books to bring it to the required height, then install the permanent stop in the track



This is complete installation of rocker-arm assembly that makes it possible for child to lower table.





10. Upper-pivot assembly; note placement of locking collars that prevent lateral movement of rocker assembly.



11. Lower-pivot assembly; note pencil marks on floor that indicate some adjustment was necessary.



12. Legs that support outboard end fold against underside when table is "stored" by folding into wall,

so the table is 29 in. high at each end. Make a final check by raising and lowering the table, then attach the lower-pivot assembly with screws. There is not much that can go wrong; you may have to move the lower-pivot assembly forward or back 1/4 in. or so, which is why tack-nailing is suggested.

Folding legs are installed at the outboard end, Fig. 12. These can be the type used on folding card tables, or those for folding table-tennis tables. The last step is the installation of the closet-door type "snugger" and the drilling of the holes for the safety pins.

The doors on our cabinets were made from 1 x 6 Ponderosa Pine, held together with screwed-on cleats, Fig. 14. The doors were lipped and hung with ordinary offset cabinet hinges. Magnetic latches were used to hold the doors closed.

Fig. 15 shows the illuminated recess that adds so much to the appearance of the unit when it is set up for dining. When the project is built-in against the wall, it is easy to wire to an existing outlet. Be

sure to install a switch at the bottom of the light box so it can be controlled independently of the room lights. $\triangle \triangle$

(Note: Materials List includes only materials for table and parts necessary for installation in a cabinet or built-in of your choice.)

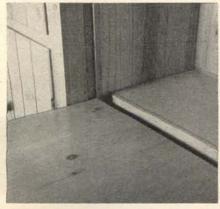
MATERIALS LIST

- 1, Table Top, 1¾" x 36" x 82", hollow-core exterior door, 1 req'd.
 2, Table Panel, ¼" x 36" x 82", knotty pine panel, 1 req'd.
 3, Track, ¾" x 3" x 60", 2 req'd., pine or maple
 4, Filler, ¾" x 1½" x 83", pine, 2 req'd.

- Bearing-Support Assembly
- 5, 34" x 2½" x 34½", plywood, 1 req'd. 6, 34" x 2¼" x 34½", plywood, 1 req'd.
- 7, ¾" x 3" x 5½", plywood, 2 req'd. 8, 1¾" x 2" x 2¼", pine, 2 req'd.
- Bearing, (see text), 2 req'd.
- 10, Cleat, 3/4" x 4" x 35½", pine, 1 req'd. 11, Upper Pivot Block, 1½" x 2" x 3", pine, 2 req'd.
- 12, Upper Pivot, ½" Dia. x 21", steel rod, 1 req'd.
 13, Lower Pivot Base, ¾" x 4" x 19", pine, 1 req'd.
 14, Lower Pivot Block, 1½" x 4" x 5", pine, 2 req'd.

- 15, ½" Dia. x 22", steel rod, 1 req'd. 16, Lock Collars, (see text), 8 req'd.

- 17, Pivot Arm, 1½" x 3½" x 11", pine, 2 req'd.
 18, Pivot-Arm Extension, ¾" x 3½" x 15", pine, 2 req'd.
 19, Rocker Arms, ¾" x 14" x 48", plywood or Lebanex, 2 req'd.
- 20, Brace, 34" x 5" x 16", pine, 2 req'd.
- 21, Leg Cleat, ¾" x 5" x 35½", pine, 1 req'd. 22, Folding Legs, (see text), 2 req'd.
- 23, Door-Height Stop, to fit track, maple, 2 req'd.



13. Top of light box and surface of table are at same level. Note relationship of track, filler and unit facing.



14. Cabinet-door construction is simple if done with 1 x 6 boards and cleats cut from Western Pine.



15. Light-box area is fine for displays. Backing here is Western Pine "carved" with rotary planer.

A CLEAN WORKSHOP

WARNER BENSON

There are many more reasons to keep your workshop clean than just to prove you are a better "housekeeper" than your fellow craftsmen. The first reason, of course, is that a clean shop is easier to work in; you can find tools and supplies more quickly, and it is not necessary to constantly move tools and equipment out of your way as you work.

Second is the safety factor. Scraps of wood on the floor can trip you, tools and material left on benches can fall and smash toes. Just one small block or scrap of wood left on a table or radial-arm saw can be hurled in your face if you turn on the machine without first checking to see if there is anything resting against the blade. And that same scrap, even a splinter, can keep your work from being held squarely against the saw fence.

In most home workshops both woodworking and finishing are done. If sawdust and scraps are allowed to accumulate, paint and thinner can saturate these materials and become highly inflammable. Just a spark, or a carelessly dropped match can start a fire in a moment. Keep the floor swept at all times, but especially be sure that the floor is clean when you start painting and refinishing. Open a window when using flammable materials; you need ventilation to prevent a toxic accumulation of fumes, and if your shop is in the basement - many shops are - the hot-water tank or furnace provides an automatic means of igniting fumes that collect in a shop.

When you have rags for clean up when painting, or for any purpose, keep them in a metal container with an air-tight lid. Spontaneous combustion is always a threat with cloths that are piled in your shop. Should they spontaneously ignite in a metal container with a tight lid, they will merely smolder harmlessly. Quite likely the lack of oxygen will smother the potential fire before it ever becomes big enough to even warm the metal of the container.

If you do much painting in your shop, use several layers of newspapers to catch any drippings. Dispose of the paper immediately after the job is done. Never let an accumulation of paint build up on the floor of your shop. It will present a fire hazard, and an uneven floor often causes other troubles. Have you ever placed a big job on the floor because you had no bench or supports large enough to handle it? An accumulation of paint in one area will make a rough spot that will make it impossible to level up a job. And, it is a lot easier to wipe up paint that has not hardened than it is to chisel up several layers that have set to the consistency of concrete. Once you have the floor of your shop really clean, it is a good stunt to apply several coats of non-slippery wax. When paints or other materials are spilled, the wax will prevent them from sticking to the floor. Do not apply too many layers of wax, as you set up for another fire hazard if you do.

If it is at all possible, rig up an

exhaust fan in your shop. It can be routed through the wall, or through a window. A pane of the window can be replaced by a piece of hardboard or plywood and the fan installed there. With such a fan you can keep the air in the shop reasonably free of sawdust, and it will be invaluable when painting. Keep in mind there should be a source of fresh air entering your shop as the fan exhausts the air to the outside from your shop. Finally, be sure the fan exhausts to an area that has ventilation of its own, and where there are no other fire hazards. \triangle \triangle



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-JOHN D. PETTIS, 172 N. Fulton, Bradley, Illinois

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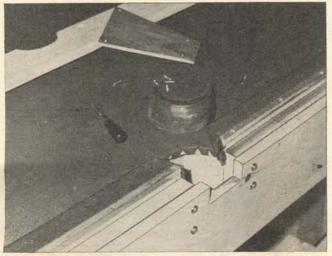
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HOME POOL TABLE



1. After the wood liners are installed, the rail sides can be positioned with a block the thickness of the rail tops.

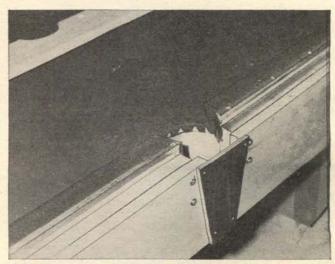


2. Both blind panels are notched opposite the side pockets to provide clearance for the pocket inserts and the balls.

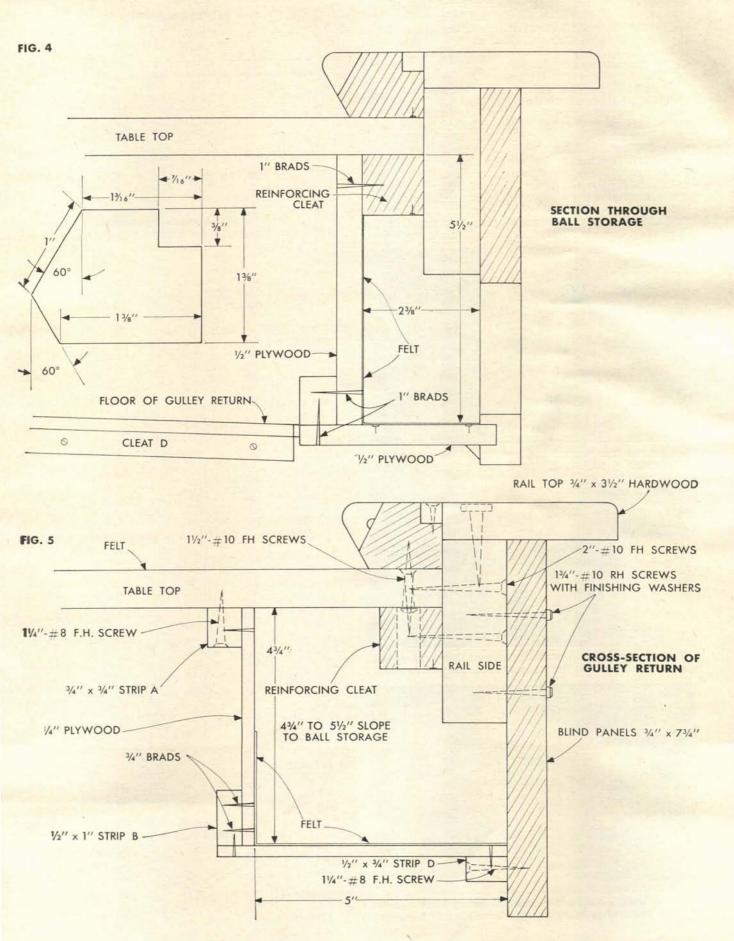
PART III

C. L. WIDDICOMBE

While the wood liners were described in Part II, they were not shown, so a drawing of them is in Fig. 9. Also, while the installation of the rail sides and panels was described in Part II, these operations were not shown, they are in this part. In Fig. 1 is shown a simple method of properly positioning the rail sides; they are clamped loosely to the reinforcing strips of the table top, then accurately located by using a block of wood of the thickness of the rail tops. The notched blind panels are next installed, being positioned with their upper edges flush with the upper edges of the rail sides, as in Fig. 2. Note also in Fig 2 that the notch is not too neat or exact. It is covered with a panel of 1/4-in. hardwood-plywood as in Figs. 3 and 9. The rail top, when installed, hides the notch completely. The rail tops are mitered and fitted in place, then radiused at the pocket locations for the plastic inserts, Fig. 6. The inserts must be purchased from a billiard-supply



3. Plates cut from 1/4-in. hardwood plywood are fitted over notches in blind panels, rail tops finish hiding notches.

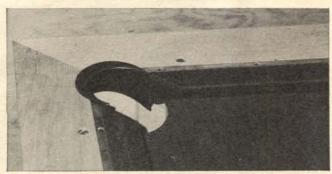


house. (Of the four supply sources listed in Part I of this article, F. Grote & Hubble has informed us that they sell wholesale to distributors only, so are not a source of supplies for individuals.) The plastic liner is fastened in place by using a small nail at each end, Fig. 7. Recess the nails slightly so they will not scratch the balls as they enter the pockets.

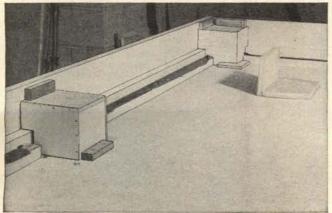
On the original table the pockets were simple boxes attached to the underside of the table top, Figs. 8 and 9. You may prefer to use one of the many styles of manufactured pockets that are listed in the catalogs available from the supply houses. While the top is removed for installing the pockets, or the gulley-type return, fit levelers to the leveler cleats on the bases of the legs. These levelers also are purchased from a billiard-supply house, and are of heavy-duty type. Fit them near the ends of the leveler cleats. They have not been installed before, because the fitting of the various components on the top has required the table to be moved about, which would have required a



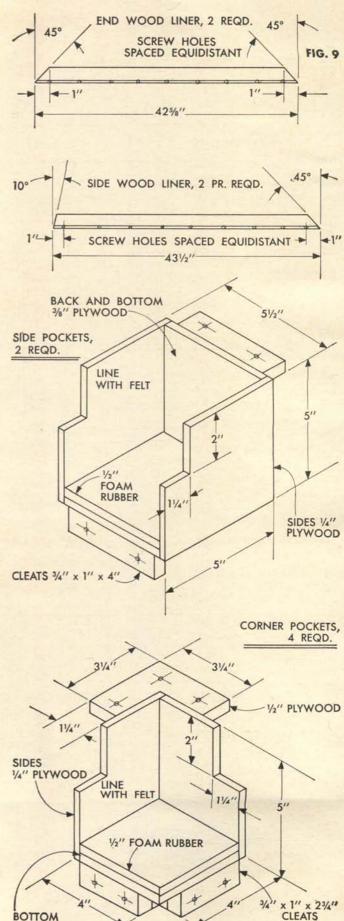
6. After rail tops are mitered and fitted they are radiused at locations of pockets to accept pocket inserts of plastic.



7. Inserts are fitted in pocket openings, then secured with small tack at the ends. Recess tacks so balls are not scratched.



8. If you want to eliminate expense of factory-made pockets, or time required to make gulley returns, build "box-type."



3/8" PLYWOOD

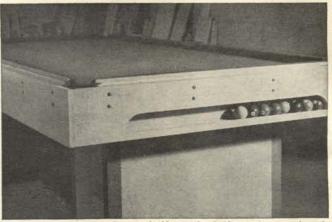
constant readjustment of the levelers to keep the table solidly on the floor.

Construction of the gulley returns is detailed in Figs. 4 and 5. The end blind panel that is slotted to permit reaching the balls, Fig. 10, was dimensioned in Part II. The storage shelf behind the opening is detailed in Fig. 4. If single pockets are installed on the table and the shelf is used just for ball storage, the shelf is flat. If the shelf is used with a gulley return, it is made with a two-piece bottom, each piece slanting toward the center so the balls will roll to the center. The back of the shelf—or receiving box, if used with a gulley return—is bradded to the reinforcing cleat on the underside of the table after a 3/4 x 1-in. cleat is nailed to the lower edge, to which the bottom is attached.

The two gulley returns run the length of the table on each side. A support cleat is screwed to the blind panels, sloped from the opposite end of the table. The cleat is positioned so that the distance from the underside of the table top to the upper surface of the gulley floor is 4¾ in. at the opposite end of the table, then slopes down to meet the receiving box that has the floor 5½ in. below the underside of the top. The gulley floor is lined with felt, and the felt also is run part way up the sides of the gulley, to reduce the sound produced by the rolling billiard balls.

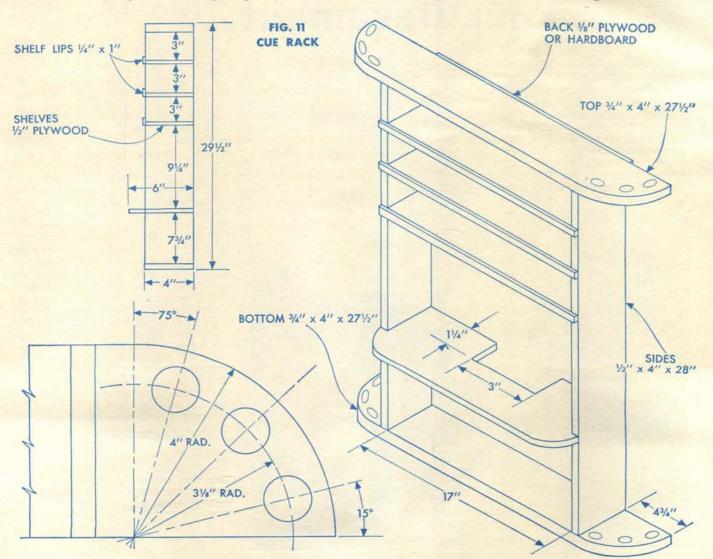
(In regard to ball size: The distance from the table top to the center of the cushion is 1¼ in., which requires a billiard ball 2 in. in diameter.)

The cue rack, Fig. 11 is of fairly simple construction.



10. Balls are stored on shelf reached through opening in end blind panel. They also run here from gulley returns.

There is storage space for six cues, the balls, chalk and other accessories. The lower shelf is wide enough so it will accommodate an occasional soft-drink bottle that a player may put aside while making a shot. Wood used for the rack should be the same as that used for the table. After construction there is one very important consideration: Position the rack on the wall so there is space between the top of the rack and the ceiling so that when cues are inserted up through the top and the butt ends dropped onto the lower shelf, the cue ends will not touch the ceiling. \triangle



Temporary covering for door to laundry room is simple drape. Note lack of molding along floor and the ceiling.



Beautify

Your Basement...

PART III

Because remodeling a basement takes considerable time—months, perhaps years—the family will start using the facilities long before the construction is complete. This is true in the WORKBENCH basement project; note the lack of molding between wall and floor and between ceiling and wall in the photos of the recreation room. Note also the bare bulbs that have not been re-

placed by recessed fixtures or other types of lighting. The furnace ductwork that shows in the room will simply be painted white to match the ceiling of Armstrong acoustic tiles. We determined that this was the simplest and least expensive way of handling these surfaces.

One advantage of utilizing the rooms in the basement before their completion is that errors in design quickly show up, and at this stage of construction changes can be made without too much trouble. In the case of our basement we quickly saw that the recreation room had the long, narrow look so common in basement rumpus rooms. Besides not looking well, the narrow room also had no space for the Vega pre-fab fireplace we wanted to use for auxiliary heat.

Our solution was to remove a couple of the Simpson Easy-Wall Partition panels and build a recess for the fireplace. As can be seen in the photos, the recess immediately made the room appear wider. The fireplace is located where it can heat the entire room, but takes no space in the room. The recess also provides an attractive setting for the Vega unit.

To give greater visual depth to the recess, the back wall was covered with Z-Brick. The Z-Brick was cemented to plasterboard nailed to a simple frame of 2 x 4s. An opening was made for the thimble and 7-in. stovepipe used to vent the gas logs used in the fireplace. While not shown in the photo,

This shot shows how room has long, narrow look which was eliminated by making recess for Vega pre-fab unit.

From this angle fireplace recess is visible. It gives room visual width, allows fireplace to heat entire room.

the stovepipe was fitted in a reducer and a 3-in, vent was run to the chimney to exhaust any fumes.

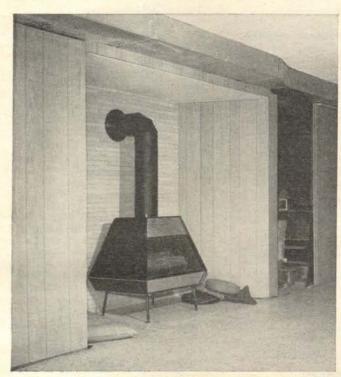
Why the need for auxiliary heat? In this basement—perhaps in yours -the recreation room is on the side of the basement away from the hotair duct; the duct showing is for cold air. On the other side of the wall the rooms stay fairly com-fortable just from the radiation of heat from the duct. In the office an opening was cut in the duct, and a closeable vent was installed. When the office is not used, the vent is closed to assure a proper supply of warmth to the upstairs. If you cut a number of openings in the hot-air duct to heat the basement, chances are that many will not be closed when the basement is not being used. This will throw the heating system out of balance and you will get cold rooms upstairs. It is best to leave the heating ducts alone and install an auxiliary heating plant that can be used only when needed. The Vega fireplace does the job well, and is extremely attractive besides.



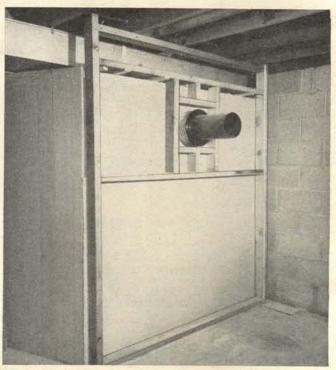
As in the office, Armstrong vinylasbestos floor tile is used in the recreation room. The light color of the tile on the floor and the ceiling make this room bright and cheerful with just a few lights, even though there is no window in the room. The warmth of the Z-Brick

on the long wall effectively insulates the foundation wall and adds real beauty.

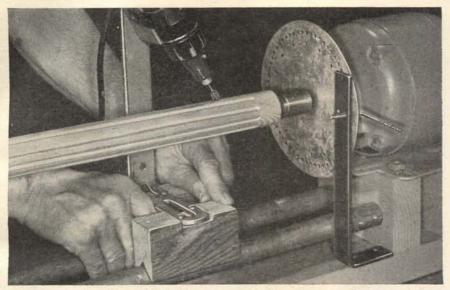
The bar is a simple structure of 2 x 4s and plywood, fastened to the wall at one end, and around a soil pipe at the other. Details will be given in a future issue.



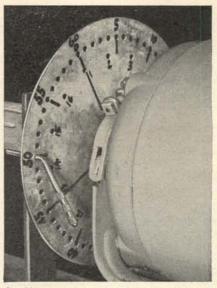
Besides being a practical installation, recess makes fine setting for attractive Vega pre-fab fireplace.



View of back of recess shows simple 2 x 4 frame covered with plasterboard to which Z-Brick was cemented.



 Sheet-metal indexing disk is held securely at various equidistant positions by stationary post and tapered pin while cutting flutes; fixture slides on ways.



2. Closeup view of other side of indexing disk. Numbered holes help.

SIMPLE INDEXING HEADS ENNO R. HAAN

For wood-turning lathes not already equipped with a dividing or indexing head, a simple home-made one will give accurate results. It holds the work at equidistant divisions of its circumference so you can mark or groove it lengthwise at these points, or drill equidistant holes along the edge of a disk. Also, indexing fixtures can be made to rout and flute cylindrical work in a drill press, groove it with cutters on a circular saw, or cut flats on it with a jointer.

The simplest kind of an indexing head consists of a sheet-metal disk having a number of equidistant holes along its edge. This is attached concentrically to the shaft or spindle that rotates the work, or to a pulley on the shaft. To hold the work rigidly at any point, the disk is pinned to a post that is

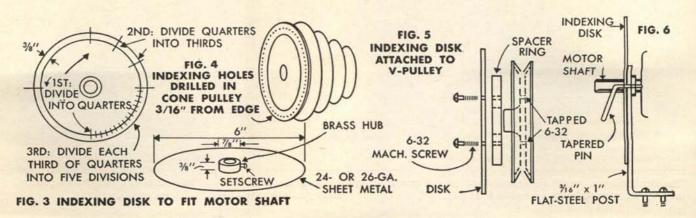
screwed or bolted to a sturdy, nonrotating part of a lathe or fixture, or may be clamped to the ways of a lathe or even to the stand on which a lathe is mounted.

Figs. 1, 2, 3 and 7 show a 6-in. indexing head of this kind, mounted on the shaft of a motor which was used as a direct-drive headstock of a home-made wood-turning lathe. In making the disk, a piece of flat sheet metal, (24 or 26 ga.), is first center punched lightly for scribing a 6-in. circle so the disk can be cut out quite accurately with a pair of tin shears. From the same center a small circle is scribed to outline the position of the hub. This is a piece of solid cylindrical brass 1/8 in. in diameter that is soldered to the disk after drilling and tapping a hole for a setscrew.

When the hub has been soldered

in place it is centerpunched lightly and accurately to scribe one or more circles on which holes are to be drilled. The disk shown in the photos has an outer circle of 60 holes and an inner one of 16 holes. A 60-hole index disk enables you to divide a disk or cylinder into 2, 3, 4, 5, 6, 10, 12, 15, 30 and 60 equal divisions. A 16-hole circle gives 2, 4, 8 and 16 equal divisions. Obviously there are many divisions of a circle that cannot be obtained with a disk having this arrangement of holes. Therefore additional disks having other hole spacings can be made, although one with 60 holes will serve most requirements in the average shop. One having 63 holes makes it possible to obtain 3, 7, 9, 21 and 63 equidistant divisions of a disk or cylinder.

To accurately prick punch the



scribed circle for drilling 60 holes, first divide it into quarters with a divider, then divide each quarter into three equal divisions, and lastly divide each of these into five equal divisions as shown in Fig. 3. Then you can locate the point of the prick punch where the scribed lines cross. The above method of division is faster and easier than marking off 60 divisions on the circle with dividers.

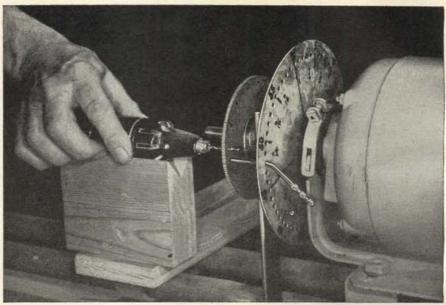
Next, drill a pilot hole through the hub at the center punch, and then enlarge the hole with a second drill equal to the diameter of the shaft on which the disk is to be mounted. The hub should fit the shaft without play. Then drill the holes in the disk, after which you mount it on the shaft and rotate under power so you can dress down the edge of the disk with a file for smoothness and concentricity.

On lathes having a headstock pulley run from a countershaft, the pulley itself can be drilled along its edge as shown in Fig. 4, or a separate disk of sheet metal or tempered hardboard can be attached to the pulley as in Fig. 5. In such cases the pulley is first removed from the lathe and the disk is fastened to its side with machine screws that fit tapped holes in the pulley. Care must be taken to get the disk concentric with the pulley.

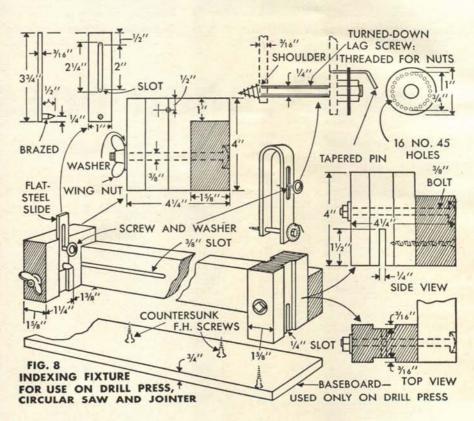
Fig. 6 shows a stationary post to which the disk can be fastened with a slightly tapered pin. It is a length of 3/16 x 1-in. flat steel bent to an L-shape and screwed, bolted or clamped securely — the exact method will vary with the construction of the particular lathe involved. The hole or holes in the post to accommodate the pin should be located at the height of the live center. For disks having two or three circles of holes the post must have two or three holes so that each will line up with holes of a different circle.

Fluting a cylinder on a lathe can be done with the aid of a fixture such as shown in Fig. 1. The base has two V-notches to fit the lathe ways, permitting the fixture to be slid back and forth parallel to the axis of the work. The cutting bit should be positioned centrally over the work. A small, high-speed router is mounted on the fixture or the bit may be held by a flexible shaft fastened to the fixture.

Fig. 7 shows a simple arrangement to drill equidistant holes through a disk. Here a V-block is attached crosswise to a base which is clamped or otherwise fastened to the lathe bed. This permits sliding a small hand drill in the Vee. The drill bit should be located at the height of the lathe center. Moving the V-block toward or away



7. Small hand drill slides on V-block for drilling equidistant holes near edge of hardboard disk. Drill is at center height and V-block is adjustable.



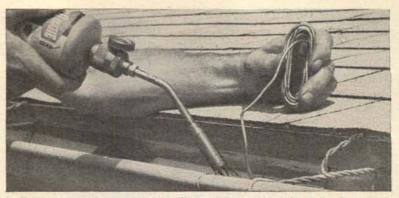
from the center varies the radius at which the holes are drilled.

For use on a drill press, circular saw or jointer, a fixture with an indexing head is shown in Fig. 8. A fence is required on the worktable. The indexing disk is smaller than the one used on a lathe, and it has fewer holes that also are smaller. To accommodate work of various lengths one end of the fix-

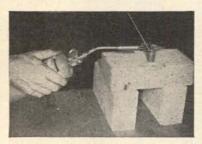
ture is movable. The centers are brazed to flat metal slides so that the surface of the work from 1 to $2\frac{1}{2}$ in. in diameter will contact the table of a circular saw or jointer, in which case the baseboard is detached from the fixture. Care must be used to place the fixture so that jointer knives or cutters used on a saw will clear the end blocks of the fixture. Δ



 Both hands are free to manipulate work in flame if torch is supported in simple holder.



Because a propane torch is lightweight and easily held, it is ideal for soldering eaves troughs and downspouts as here.





3. Brazing, silver-soldering are other typical jobs for torches.
4. Intense heat of torch flame assures quick firing of charcoal.

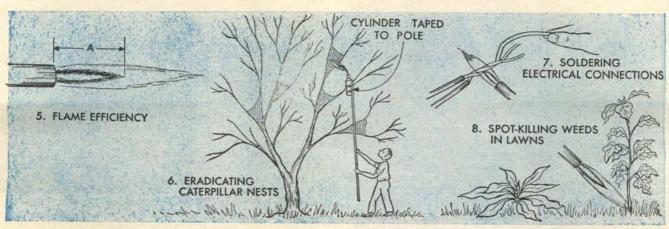
SMALL TORCH DOES THE JOB

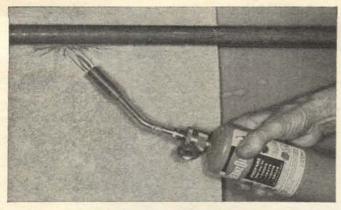
Practically indispensable to do-ityourself homeowners, propane gas
torches do many jobs easier and
faster. They are small and lightweight, and have no cumbersome
hose and tank. Unlike most power
tools, they are not dependent on
an electric cord that would limit
their range of location. They are
instantly ready for work, as they
do not need to be preheated. With
reasonable precautions, such as is
common practice when handling
containers of gasoline and flammable gases, these torches are entirely safe. You simply follow the
instructions accompanying them.

After igniting you adjust the valve to produce a flame of peak efficiency as indicated in Fig. 5. Maximum heat is produced just beyond the tip of the blue cone in the flame. When the torch is used upside down the flame must be readjusted. When you have finished using the torch, shut the valve tightly. Before putting the torch away, remove the burner unit from the cylinder on which it should be screwed only as tightly as can be done by hand.

When the lighted torch is set on a benchtop so that you can use both hands, as in Fig. 1, use a torch stand. This may be a tin can in which the cylinder fits, attached to a 2 x 8-in. block of wood that is heavy enough to keep the torch from being knocked over easily.

Soldering joints of roof gutters, Fig. 2, brazing and silver-soldering small work, Fig. 3, sweating fittings on copper pipes, and soldering electrical connections, Fig. 7, are typical jobs for hand torches. To repair a leaky gutter joint, first clean the metal thoroughly at the joint on the inside of the gutter, apply liquid soldering flux, such as diluted muriatic acid, then heat the metal so the solder will flow on it and into





Shield of asbestos board or sheet metal prevents igniting of combustible material behind frozen water pipe.



10. Burning off old paint from boat bottom assures clean metal surface for application of fiber glass.

the joint between the sections.

In thawing frozen water pipes, Fig. 9, you first open a faucet or valve nearby, after which you start heating the pipe at the frozen portion closest to the faucet to allow steam to escape. If there is any combustible material close to the pipe, such as wood, shield this from the flame with a suitable piece of asbestos board or sheet metal.

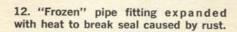
When softening paint to remove it. Fig. 10, avoid burning wood or other combustible material as the use of torches for paint removal has caused many house fires. A flame spreader on the burner head is a convenient accessory. Hardened putty on window sash is easy to soften and remove by using a large-size soldering tip on the burner head, Fig. 16. Avoid contacting the glass with the hot tip or the glass may crack.

To remove dented or cracked floor tiles, the adhesive underneath must be softened first by playing the flame on the tile, Fig. 11. When sufficiently heated the tile will be easy to remove. In doing so avoid prying along the outer edges, as this may damage the edges of adjacent tiles. When pieces of asphalt tile must be cut, the torch flame is played along the mark to

soften the tile, which makes cutting easier.

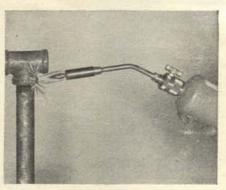
Applying the flame to "frozen" pipe fittings, Fig. 12, will expand them just enough to break the seal caused by rust, lime and hardened pipe compound, and permit loosening with a wrench. To burn tent-caterpillar nests in trees, when out of standing reach, you can tape the torch cylinder to a pole, Fig. 6. Use a large flame and direct this over the entire nest, avoiding burns on limbs.

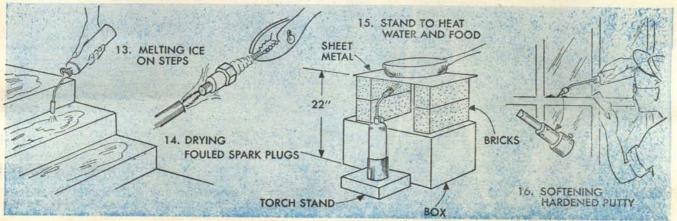
Other occasional uses for your torch include quick and positive ignition of charcoal in a barbecue, Fig. 4, or starting a fireplace. You can also spot-kill weeds in the lawn, Fig. 8, disinfect soil for seed flats. quickly melt away ice on concrete steps, Fig. 13, or dry dirty spark plugs from a flooded engine, Fig. 14. If you are dependent on gas or electricity for cooking, and are without service during an emergency, your torch will come to the rescue as a temporary substitute, Fig. 15. For utensils that are large enough the sheet metal can be eliminated. \triangle





11. Loosening floor tiles to be replaced is easy after softening adhesive.





DROP-LEAF TABLE

(Style of Sheraton, 1751-1806)

LESTER MARGON



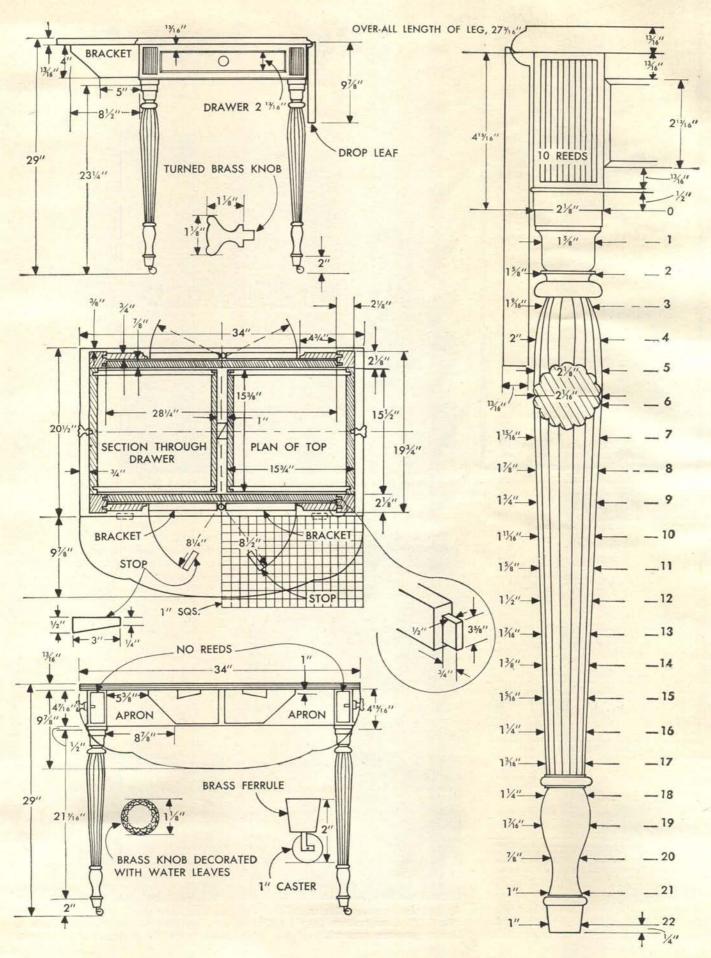
We are privileged to have this magnificent drop-leaf table in our Museum Furniture Treasures through the courtesy of the Curator of Decorative Arts of the Brooklyn Museum, located on Eastern Parkway, New York City. The table is shown in the parlor of a house from Irvington, New Jersey, 1820, and is a gift from Mrs. William Sterling Peters. The table is labeled American, possibly by Duncan Phyfe. This means that, although there is no proof, there are many features included in the construction that could have come from the shop of this great cabinetmaker.

The original table is veneered in mahogany, the wood finished with a deep, rich luster. The legs are the important parts of this item; note the 14 reeds that add to the grace of the elegant turning. The framed 10 reeds on the upper portion tie the legs into the aprons that are joined to the legs with mortise and tenon joints. Doweled joints could be substituted to simplify the joinery. Note that the longer side aprons are positioned so their inner surfaces are flush with the inner faces of the leg tops. This provides space for the fillers that are flush with the swinging brackets that support the leaves. The end aprons actually are just two strips, one above, and one below the drawers. A fine beading is formed around the edges of the drawer faces, and the same size beading runs along the lower edges of the aprons,

and continues across the upper portions of the legs.

A double hinge at the centers of the side aprons permits the brackets to swing out and support the leaves. Triangle-shape stops on the underside of the leaves position the brackets for maximum support. The table top is a simple rectangle, while the leaves are shaped in graceful curves. A pattern is made for the leaves by enlarging the squared drawing. If a mahogany plywood is used for the table, be sure to carefully band the edges of the wood so it appears to be solid stock. Incidentally, if your lathe is not fitted with an indexing device to permit accurately reeding the legs of this table, see the article elsewhere in this issue in which indexing devices are described.

Drawers are of standard construction, the fronts not overlapping the apron, but fitting inside the upper portions of the legs, and flush with the apron strips. No clearance is indicated for the drawer fronts, but the main portions of the drawers are $\frac{1}{8}$ in. narrower than the opening. Thus, the drawer fronts can be trimmed for clearance up to $\frac{1}{8}$ in. The finishing of this table is all-important. Sand all parts carefully, use filler, then sand smooth again. Apply stain, sand again, then apply a finish. You may want a satin finish, as is the modern trend; we suggest a finish such as Deft. For a shiny finish use a top-quality varnish or lacquer. Δ









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The young lady looks somewhat apprehensive about this maple chest that has too much finish and ugly hardware picked up in its 60-year life, but the upper photo shows the happy results of this project.



First step in refinishing is to place furniture on several layers of newspapers, then remove all the hardware.



Apply paint remover with an old brush, "flowing" it on, rather than stroking. Use a generous amount,

Most of the steps required for refinishing with a paint sprayer are the same as when a brush-on finish is used. First step is to place several layers of newspaper on the floor under the item to be refinished, then remove all hardware. In most cases, with old furniture the original hardware will have been lost and odd shapes and sizes of pulls and the like will have been installed. Before starting the job get some attractive hardware that will add that final touch to your renewing job.

(Continued on Page 38)



Do not hurry the job, let the remover work on the old finish and bubble it loose. On stubborn spots, apply more.

If you like to work with your hands as well as with your head.....

this free book may

lead to personal independence

We have now made it easy for anyone to get started in a business of his own. The business is made to order for the man who likes to work with his hands in addition to using his head. While the work does not call for heavy manual labor, the man who is quick with his hands gets the job done faster, collects his money and moves on to the next service job. This means that he is able to get more done in a day and earn more money for every hour he puts in. The book I want to send you tells all about this business. It shows the way to start in spare time without giving up your job-how to build to a profit of \$250 for 40 hours of personal service. No office or shop is needed as all the work you do can be done in the home of your customers. The book also shows how you can start for only a few hundred dollars and how we finance the balance which you pay in small monthly payments. Mail the coupon now for this Free Book. It may be the first step toward independence in a fastgrowing service business of your own.

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In the past, many men started businesses of their own—and failed. Some entered businesses that were already on the decline. They were as foredoomed to failure as a buggy-whip salesman. Some had no talent for the businesses they entered. Others had no experience in Grant Mauk business management.

Today, all that has been changed by reputable Franchising firms. Our Franchise business is one that has been tried, and tested, and proved by the parent company. It is one that has been shown to have an enormous and a growing market. It is a business that has been brought to a high level of success by many other men. The kinks have been eliminated. The methods and plans that lead to success have been clearly charted.

We have a Franchise business that does not require a large investment. In our business you can get started for a few hundred dollars. We finance the rest of the investment for you and let you pay it in monthly pay-ments so small that the profits on less than one day's service covers your payment. The overall investment is small—yet the potential is \$250 a week net profit. That's for a one man operation. If you have two or three or more men working for you, the potential increases accordingly

A small dealer just starting and doing his own service should gross \$180 profit from 20 hours service in a week. If he uses 30% for advertising, etc., he nets a clear \$125. If he services 40 hours, net profit is \$250.

With only two men working for him a 35 hour week brings the owner \$420 gross profit. Allowing 20% for advertising, etc., (since he has time to sell) he clears \$336.

What is this business? It's one of the fastest growing businesses in America today. It includes six different services that you perform for the housewife right in her home. No form for the housewife right in her home. No office or shop is needed. No investment in real estate. No problems of finding a good location. In fact, if you have a telephone at home and a car with space in the trunk—you have everything you need except the things we furnish. Your business comes to you on the telephone and in personal calls following up leads generated by National Advertising and by your own local Direct Mail Plan which we furnish. You quote your prices to the housewife, do the job, or have one of your men do it and collect the money on the spot.

What are these services? The first and most important is the cleaning of carpets, rugs, and upholstered furniture by a revolutionary modern process known as the "Absorption Method." The work is done right in the cusmetrod. The work is done right in the customer's home. No scrubbing with harsh motor-driven rotary brushes. No soaking with gallons of water. An Aerated Foam loosens the greasy, atmospheric dirt and holds it in suspension until it is removed. A test conducted by an impartial laboratory showed that the new absorption method in the home removed more than twice as much dirt as was removed by the old fashioned machine scrubbing.

Five other services add to your income. With portable power equipment you spray furniture and carpets with a product that retards soiling. You remove stubborn spots like magic. You spray another liquid to make fabrics flame resistant. You mend small damages such as cigarette burns and moth holes, often saving the owner the price of new fur-nishings. And finally, you deep spray fabrics with a moth killing liquid on which you can give a company guarantee for six full years.

As owner of a business, you have the opportunity to make more money than you could hope to make working for someone else. Also, should you wish to sell, you are building a business with a cash value. When an arm injury made it necessary for Al Svitak to sell after operating his dealership only 17 months, he sold to a prospect supplied by Duraclean at a price well above his original investment. G. F. Monroe sold his Texas Dealership after 12 months for ten times his cost. Leo Lubel, after 30 months, sold for \$7,116 over cost. When our Franchise owners want to sell, we help them find buyers.

If you are tired of working for Send name for FREE BOOK proposition to another; if you have good health, energy, and ambition; if you have a real yearning for independence in a business you own, send for this book. If you have thought that starting your own business would be difficult or expensive, or risky, this book will open your eyes. With our plan it is easier than ever for you to become master of your own destiny in a business you own.

There is no obligation, no charge. No salesmen to high pressure you. Send for this book now. Read it. Then decide if you want to take the next step toward independence.

GRANT MAUK, President; 4-561 Duraclean Bldg., Deerfield, Ill. 60015



OPPORTUNITIES TO FIT YOUR OWN AMBITIONS

The Duraclean Franchise is so flexible that it can be fitted to your own ambitions. As a one man business and based on the rates in our National Price Guide you can make a net profit of \$6.00 an hour—\$250 for 40 hours of servicing.

Ward Whitbeck wrote "I have made as much as \$225 in one day." L. Lawson says: "In September, working alone, jobs totaled \$1,475." L. Canaday wrote: "\$1,571 in a single month."

If you wish, you can operate as the head of a multi-crew business with others doing the work.

This increases the profit opportunity as the owner of a business can make as much as \$6.00 an hour gross profit on every hour each employee works. Even after paying him a good hourly wage, the owner can clear \$336 a week for himself with only two men on his staff.

Ed Kramsky wrote, "In my second year I now have two assistants, a nice home, and real security for my family." And, E. Davis reported "Gross income increased \$17,660 this year."

So, no matter at what level you have set your sights, here is a Franchise that is worth careful investigation. Send your name now for the Free Book that tells all angles of the business.

Grant Mauk, President 4-561 Duraclean Bldg., Deerfield, Ill. 60015

Dear Mr. Mauk: Please mail a copy of your Free Book telling how I can get a Duraclean Franchise started in spare time without giving up my present income, and how I can build a highly profitable one man business or a multicrew operation. No charge. No obligation. And, no salesman is to call on me. After reading your book I will let you know my decision.

Name		Age	_
Address	The state of the s		_
City	Zone	State	

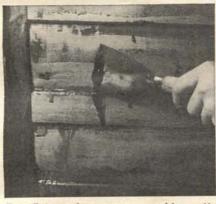
Apply a quality paint remover and let it stay on long enough to do a good job. Make sure all the finish bubbles up and is ready to be scraped or washed away. Use a ball of steel wool to scrub away the old finish; a stiff scrub brush is good for cleaning carvings and turnings. A wide-blade putty knife is ideal for scraping the finish from flat surfaces. Be careful not to gouge the wood. Final cleaning of the wood is done with absorbent cloths to remove residues of the remover. A final wipe-down with lacquer thinner is good; be sure there is adequate ventilation-and



Final cleaning of item should be with absorbent cloths to remove all residue. Use of lacquer thinner is a help.



Allow the furniture to dry overnight, then sand all surfaces lightly to remove any "fuzz" caused by the remover.



For flat surfaces use a wide putty knife to scrape off the softened finish. Round the corners to prevent it gouging.

no fire or flame, as lacquer thinner is highly flammable. Use fine sand-paper on all surfaces after letting the item dry overnight.

Small dents in the wood can be removed by using a hot iron on a damp pad over the spot. Also, any loose joints should be disassembled, cleaned and reglued. Wipe on the proper stain, following instructions, then wipe off surplus. When spraying on the finish,

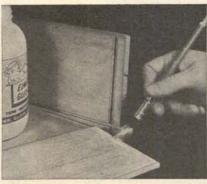
When spraying on the finish, apply many light coats, rather than one or two heavy ones. At the corners spray right on the corners so the finish goes on both adjacent surfaces. A spray finish is smooth, free of brush marks and ideal for any type furniture. \triangle



To remove small dents in a wood surface, apply a damp pad of cloth, then place a hot iron over it.



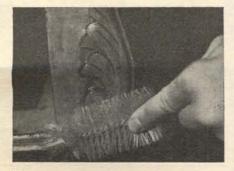
Use a ball of steel wool to scrub off the loosened finish. Best to wear rubber gloves unless you have tough skin.



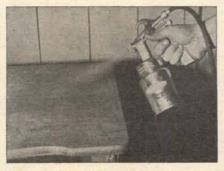
Paint remover may loosen joints that are not tight. Disassemble any such joints, clean off old glue and reglue.



Choose the stain carefully, apply in an inconspicuous spot to check color, apply according to the instructions.



Use a good, stiff scrub brush to remove the softened finish from carvings and turnings,



Best way to apply a finish is by spraying, as it eliminates brush marks, each coat is smooth and uniform.



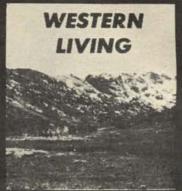
Portable compressor is handy for spray finishing, also has dozens of other uses around the home and shop.

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JUST 11/2 MILES from ELKO, NEVADA





DOWN | \$10 PER MONTH NO INTEREST

VALLEY RANCHOS



BOOMING NEVADA IS EQUALED BY ONLY A FEW PLACES IN THE WORLD. Population has surged Westward in ever increasing numbers. Westward to Nevada, where the air is fresh and clear, taxes are low or nonexistent and opportunity is open to all. Yes, Nevada is booming and real estate investors are prospering. It is a proven fact that many purchasers of Nevada acreage have realized fabulous profits from small investments. Now, a NEW Nevada Real Estate Opportunity exists for you. This Ground Floor Opportunity is MEADOW VALLEY RANCHOS, located only 11/2 miles from the thriving city of Elko, Nevada.

THE VERY BEST FEATURES OF TWO WORLDS

... THE WORLD OF THE WEST Located in prosperous Elko County, the ranchos have the backdrop of the majestic Ruby Mountains. The sparkling Humboldt River is a short 1/2 mile away. Every Rancho fronts on a graded road that leads into coast to coast U.S. Highway 40. Amidst these spectacular surroundings MEADOW VALLEY RANCHO owners can relax and enjoy the wonderful life of the Golden West.

... THE WORLD OF CITY CONVENIENCES: The bustling city of Elko with its modern schools, shops, theaters, hospital and airport is only 11/2 miles away. New homes, with FHA financing committments issued, are now under construction...less than 1 mile from the property. The Experienced, Successful Developers of MEADOW VALLEY RANCHOS are not offering remote land where purchasers have to hope for progress and expansion. They offer you the opportunity of a life time, a chance to participate in Nevada's continuing boom ... Minutes from the conveniences of hospitable Elko, in the midst of current growth and progress, MEADOW VALLEY RANCHOS has all the necessary ingredients to skyrocket in value!

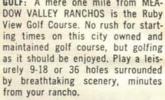


FISHING: In jewel like lakes, and mountain fed bottom streams you'll catch trophy size German Browns, Rainbow and Brook Trout . . mouth fighting Bass. RANCHO owners can catch their dinner within easy driving distance of the property lines.

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YOUR OWN LAKE ... You, and your invited guests will spend many happy hours boating, fishing and picnicking at nearby Lake Osino. There is no charge to Rancho owners for full rights to the use of this private multiacre lake and park area.





PROVEN OPPORTUNITY: Yes, individuals are taking advantage of Nevada opportunity. But the country's leading corporations are also investing in their Nevada futures. Industrial giants, who erect plants where increasing land values and population demand them, are building or have secured acreage throughout Nevada.

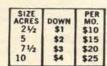
LOW OR NON-EXISTENT TAXES: As a result of Nevada's low realistic tax structure, Profits And Wages Are Kept; not paid out to the state. NEVADA HAS NO STATE INCOME, INHERITANCE, CORPORATION OR GIFT TAX. The low real property tax is definitely limited by the state constitution, YES, NEVADA IS ONE OF OUR LAST FRONTIERS OF TAX FREEDOM!

TOTAL COSTS: The full price of the title to your 21/2 acre Rancho is only \$595.00. Complete payment schedule is \$1.00 down and \$10.00 per month. No interest, no carrying charges. Live, Vacation or Retire on your land, or simply hold for investment security. Wise men like Andrew Carnegie said, "More money has been made in Real Estate than in all industrial investments combined." Make MEADOW VALLEY RANCHOS' PROSPEROUS FUTURE - YOUR FUTURE. DON'T MISS THIS GOLDEN OPPORTUNITY!

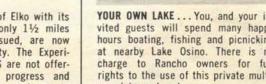
MEADOW VALLEY RANCHOS 2092 Stockmen Bldg., Elko, Nevada

MAIL COUPON TODAY

Yes! — Reserve acreage at MEADOW VALLEY RANCHOS for me — 2½ acre parcel, \$595 — payable \$1 down, and \$10 a month, no interest no carrying charges. Send purchase contract and map showing exact location of my holding. You will return my deposit if I request same within 30 days. Have indicated below number of Ranchos desired.



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City:	Zone:	State:



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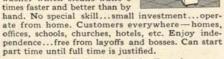
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PLANS, FULL-SIZE PATTERNS \$1.00 each, or SEND \$2.00 for Plans of ALL THREE Machines illustrated above. REFUNDABLE, FREE CATALOG!

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BETTER SEEING

In Your SHOP

JAMES R. GREGG, O.D.

Your comfort, efficiency and the pleasure you get from working in your home shop are dependent on its "see-ability." This means proper illumination, correct eye protection and eyes that are up to the task of seeing without being strained.

At least 25 to 30 foot candles of light are required on working areas. Use this page as a test; note the readability when it is held 3½ to 4 ft. from a 100-watt bulb. Compare with the light on your work. Beware of a shop that relies on light from windows; the artificial lighting at night may not be sufficient. Make sure, also, that the whole shop is not so uniformly dim that it seems well lighted when your eyes adjust.

As to kind of lighting: There should be diffuse general illumination by indirect lighting, with adjustable spot lamps for working areas. Be sure there are no dark areas or shadows in the shop.

You wouldn't work with a bare bulb glaring in your eyes; but how about areas of high reflectance, such as shiny saw tables and the



You wouldn't work like this with a light glaring in your eyes, but how about glare from shiny surfaces?

like? Direct the light on the work, so the reflected glare is eliminated or minimized.

The height of work areas is important. Equipment, benches and tables should be adjusted to suit you. This is determined by eye-towork distance for you. It may be anywhere from 16 to 20 in. or so; you determine it by finding the point at which you see best and where your arms work without fatigue. There should be no need to get too close or too far from the work.

In arranging your shop keep tools, materials and equipment located for easiest seeing. Large items that need not be seen clearly can be high on walls and shelves. Small tools and parts are handy at eye level. Labels are large and



If you wear bifocals, store small items low so you don't have to tilt your head back to see these items.



Measure your prime working distance. How far from your eyes to where you see clearly when doing shop work?



Make sure tools are arranged in your shop for easy seeing; someday you may need glasses.

clear so you need not get close to identify them. This matter of seeing heights and distance may seem unimportant if you have not reached the bifocal age, (the midforties), but some day it will. If you use bifocals now, you realize how important it is to arrange work to minimize the need for tilting your head and crowding close to permit using the bifocal part of the lens.

If you can work in your home shop, even after a hard day on your regular job, with complete visual comfort—whether you wear glasses or not—your eyes quite likely are in good condition. However, if you find yourself making mistakes when you get tired, or your eyes get blurry and headaches and fatigue take away the pleasure of working in your shop, better have your eyes checked.

No matter how good your vision, protect your eyes in the shop. Use safety glasses, goggles or a face mask when doing any kind of work where chips of material can fly toward your eyes. Don't wear safety devices only when doing "very dangerous" work. Even a table saw can throw a hard chip of wood—or a piece of an unseen

nail-into your eyes.

If you wear glasses, check to make sure you do not need lenses just for shop work. The focal power of the lens should be based on the actual working distances in your shop. Measure these distances and take the figures with you when you go for an eye examination. If this matter of glasses for your work rings a bell, you probably are in the bifocal stage; your shop can present some real seeing problems. Sometimes a very large bifocal, with one half the lens or more included, would suit you best. Or, a trifocal with a middle section for seeing at arms' length.



NOW you can have a FULL SHOP of tools with the new ultimate SHOPSMITH MARK VII... the world's most advanced multipurpose power tool.

Designed and built with fine machine tool quality. Seven power tools in one. A 10" table saw, horizontal boring machine, 16½" drill press, 34" lathe, 10" disc sander, shaper and built-in sawdust vacuum to clean up while you work, PLUS the Original Variable Speed Drive.

Now you can save money on home repairs, furniture making. Enjoy a profitable, pleasant hobby with the only true multi-purpose power tool available. This one unit in only a 5' x 2' space enables you to start and finish any job. These 7 tools purchased individually would cost as much as \$935. And you would need at least six times as much floor space. A Mark VII at \$369.50 saves you a minimum of \$565. See this marvelous Shopsmith yourself. Write for colorful 12 page catalog and name of your nearest Magna dealer.



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Dept. 29 Interstate 75, Evendale—Cincinnati, Ohio 45215

How are your JOINTS?

... uneven ... rippled gouged ... or slanted?

If they are, you'd better try the positive Magna-Set method of setting knives on jointers and planers. Magnetic force helps make the job simple, fast, and accurate!

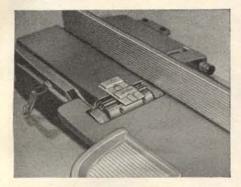


Photo shows Model J-7 being used on jointer-planer.

NOW - TWO MODELS AVAILABLE:

Model J-7 for jointer-planers . . . \$ 6.50 each Model JP-3 for thickness planers . . \$12.95 each

Both models are suitable for 4, 6, and 8 inch machines; for larger machines, you need one unit for each six inches of knife length. You can buy MAGNA-SET at better hardware, building supply, and wood-working machinery dealers. (Dealer inquiries invited.) If not available locally, order yours direct from:

MAGNA-SET CO., Dept. C

632 New Haven Avenue

Milford, Conn. 06460



...your way to finer refinishing and painting with high-quality Sun Ray Steel Wool . . . 7 grades, available at leading hardware and paint dealers. Write for free folder on "steel wooling" tips. The Williams Company, Dept. WB, London, Ohio.

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Glasson for print, an pression work without eye strain, Clips on regular glasses, Only \$2.98. Also have High-Fashion Two-Tone Regular frame Magniying glasses for men and women \$3.98. Satisfaction Guaranteed if no astigmatism or eye disease. State age, sex. We pay postage on prepaid orders. We are also sex. We pay postage on prepaid orders. We are also provided the property of the property of the provided that the provided





You need eyes to see; always, but always wear safety glasses when they are needed for shop work.

You might require only a single lens with a focal length of 20 to 24 in. to handle your over-all requirements. If you must see clearly above eye level, you may require a double bifocal which has an area for 'near' seeing at the top. In many cases the glasses you



Setting up machines, looking into awkward locations requires large bifocal, high in lens.



Properly fitted bifocals should permit easy seeing down, farther out than "reading" distance for shop work.



If safety glasses are uncomfortable, use a shield or goggles. Some fit over glasses, others cover face.

wear for every-day use will not do best in your shop; check with your eye doctor to make sure. Keep your shop well lighted with indirect illumination, plus small adjustable lights for tools and work areas, protect your eyes, and wear the proper glasses when needed. Your shop will be a place of safe, comfortable relaxation. \triangle



If your glasses are focused too close they cause an uncomfortable working posture, will tire you.

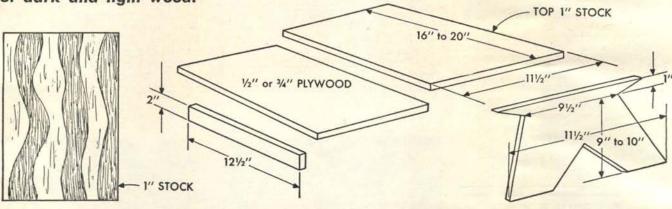
New touch to a classic hand-tool project is a top in ribbons of dark and light wood.

"STRIPE-TOP" BENCH

PAUL FAULK

Here is our old friend the "fiveboard bench" with a new touch, a top in "ribbons" of two different colors. The secret here is that you make two bench tops at the same time. Two tops of different colors of wood-in the case shown it was white pine and redwood-are cut to size and finished, then clamped together and cut on a bandsaw, jig saw or coping saw to produce the "ribbons" as indicated.

The next step is to substitute light and dark strips of wood in each top so you end up with two tops with alternate dark and light stripes. The striped tops are glued to pieces of plywood, then the rest of the parts are cut to size and the bench is assembled. Finish with a clear sealer-finish. Buff with steel wool for a satin finish, then use a paste wax and buff it well. \triangle \triangle



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this valuable book shows you now to start, how to get business from home owners, factories, carpenters, etc., and how to make profits fast. Mail coupon today.

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Here's a proven practical way to earn extra dollars in spare time – to develop a money-making repair business of your own. Investment is small. There's no overhead, no stock of goods to carry. No experience needed, no canvassing. You do it with the famous Foley Saw Filer that automatically sharpens all kinds of saws – and the Modern Lawn Mower Sharpens all kinds of saws – and the Modern Lawn Mower Sharpens and the transfer that precision sharpens all transfer that the same that t ener that precision sharpens all types of mowers.

EARN \$3 to \$6 An Hour

Hundreds of people like yourself are making cash like this — \$20 to \$30 a week — right now in spare time. "My spare time saw filing business has made me \$952 these first ten months"—says R. T. Chapman. Many have built a complete sharpening service with such year-around profits. You can too, simply by following the sure, easy Foley Plan.

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BRING THEM OUT IN THE OPEN WITH THE **NEW SUTTON 8"** BENCH SAW!



Look at this sensational value direct from manufacturer to you. Costs less than the average hand power saw yet gives you more work saving advantages and more professional results. Cuts all wood up to 2½" thick. Masters wallboard, formica, masonite. Easily cuts brass and aluminum. Provides complete accuracy on any job — mitering, ripping, grooving, cross-cutting. Comes with blade, guard, splitter fence and miter gauge at no extra cost. Table size is 15" x 18" long. Easily portable.
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Apply with a paint brush. It's heavy-bodied-won't run on uprights. Retains its consistency regardless of temperature. When paint is softened, slide it off with a putty knife. No wash-up with solvent needed. Effective on paint, enamel, varnish and other finishes. At paint and hardware stores.

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WORKBENCH

Women's Page

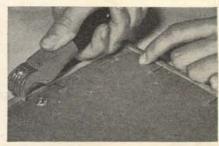
CHANGING THOSE OLD PICTURES

Are you getting tired of looking at those prints that have been hanging on the wall for years? Do you feel the need of exchanging nursery pictures for others that keep pace with your developing child? Then change them; it is a simple matter to replace old pictures with delightful new prints that you have saved from magazines, calendars and newspaper supplements.

First step is to remove the dust cover on the pictures, after cutting through with a razor blade, Fig. 1. Remove any screw eyes or tacks from the back of the frame, then



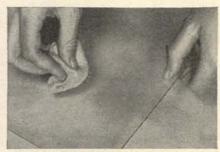
1. Start by removing dust cover after cutting through with razor blade. Also remove wire and screw eyes or tacks.



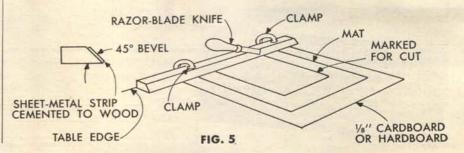
2. Scrape back of frame clean of residue, traces of glue after moistening with wet sponge or cloth to soften it.



3. Use pliers to extract brads holding usual cardboard backing. Don't press downward as this may crack glass.



4. Clean glass thoroughly, first rubbing edges with emery cloth to eliminate sharpness that may cut.

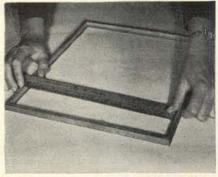


TEST YOUR TALENT!



6. Trim down wide, plain border of picture to eliminate need of mat. Small pictures are glued to mats.

moisten the remaining paper of the dust cover with a sponge and scrape off the residue, Fig. 2. Remove brads holding the cardboard backing, Fig. 3, with pliers. Remove the picture, then the glass. Clean the glass carefully, Fig. 4, after using emery cloth to dull the sharp edges.



7. Measure frame accurately to determine exact size that mat or picture must be cut to fit neatly in frame.



8. Slip-jaw pliers are handy to press brads into frame. Adhesive tape on jaw contacting frame prevents marring it.



CONTEST PRIZE:

\$535.00 Scholarship in Commercial Art

Draw the boxer any size you want except like a tracing. Use pencil. Everyone who enters the contest gets a free estimate of his talent. Winner receives a complete course in commercial art. Students are taught, individually, by professional artists on the staff of America's largest home study art school. Purpose of contest is to uncover hidden talent. Entries for March 1964 contest must be received by March 31. No entries can be returned. Our students and professional artists not eligible. Contest winner will be notified. Mail your drawing today.





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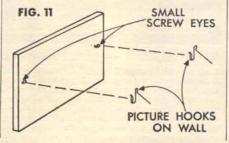


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plain, wide border can be trimmed, Fig. 6, and used without a mat. Carefully measure the inside of the frame, Fig. 7, to determine the size to cut the picture or the mat. Use pliers to replace the brads that hold the picture and cardboard backing, Fig. 8. Spread glue sparingly, Fig. 9, to provide a tacky surface to which the dust cover of kraft paper, Fig. 10, is applied. Where a picture will not stay level because of vibration, use two screw eyes and two hooks, Fig. 11, to eliminate the problem. \triangle \triangle



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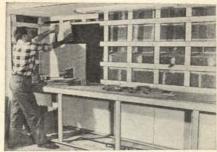
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Build a Music Corner



Saw, hammer and stapler were basic tools for making this music corner in basement. Also required: work.



Frame of 1 x 2s is used for cabinet that has plywood top. Framing on walls is covered with building felt.

If you need a spot to store a collection of records and a place for hi-fi equipment to play those records, a corner of the basement might do the job. The Barrett Division of Allied Chemical Co. suggests a framing of 1 x 2s over the walls on which acoustical tile can be sta-pled. There was some moisture seepage in the basement shown, so building felt first was stapled over the 1 x 2s, then the tiles were stapled over the felt. A droppedceiling over the cabinet-made from 1 x 2s with a plywood topconceals a fluorescent lamp that illuminates the cabinet top.

The cabinet has a 3 x 3-in. toe space and a floor also made of



Translucent panels were cut to size to make sliding doors. An added touch here would be lights behind doors.

plywood. The back of the cabinet can be plywood nailed to the 1 x 2 framing on the wall, or even inexpensive plasterboard. A plastic laminate will make the cabinet top easy to keep clean. It is applied with contact adhesive. Your choice of tile is used on the floor. The acoustical tile will prevent reverberation of sound within the room, but to prevent passage of sound to the upstairs first nail one, and preferably two, layers of plasterboard to the floor joists. Apply the acoustical tile over the plasterboard.

Sliding doors for the cabinet can be cut from translucent fiberglass or perforated hardboard. A A

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9. Children's playhouse



34. Linen closet with slide-out drawers



Workbench-toolrack



19. Entertainment center with room divider



13. Tubinette and water heater cabinet



14. Portable, knockdown ice fishing shelter



15. Enclosed porch



21. Peg-Board closet

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WORKBENCH

Research Department

Each issue in this column we will choose questions on home and shop subjects from letters sent to us. Only those questions which have wide appeal will be answered here. Questions on specialized subjects will be answered by individual letter from the Research Editor's Desk.

My problem is squeaking floors. I used shiplap subflooring when I built my home 8 years ago, covered this with 5%-in. plywood in the kitchen and bathroom. After the first year these two floors began squeaking when we walked on them. Our hot-air furnace has a humidifier so the trouble cannot be due to excessive dryness. We finished the basement, including the ceiling as soon as the house was completed, so we can't get at the underside of the floor to check it there.

W. R. A., Wenatchee, Wash.



Sorry to disagree with you, but the problem is due to dryness. In fact, it cannot be due to any other cause. The floor boards have shrunk appreciably, and in so doing have pulled the nails just enough to permit movement of the boards, one against the other.

It might be possible to drive long finishing nails through the linoleum, the top floor and subfloor into the joists and eliminate the squeaks that way, but we hesitate to recommend this procedure. If you set the nail heads through the linoleum and into the top floor, the small holes in the linoleum will tend to fill in time and be less conspicuous. The only other sure remedy is to remove the basement ceiling material so you can get at the subfloor. Then you can remove the squeaks by driving screws up from below into the top floor.

We recently poured a concrete slab for our garage floor. Salt and other snow-melting chemicals that drop from cars usually cause damage to concrete garage floors; is there a way to prevent this? C. C. Mc., Montpelier, Ohio.

You can coat the floor with a clear masonry sealer, which will offer some protection against pitting. Or, for better protection, coat the floor with sodium silicate, (water glass), although this coating is not quite as durable against tire wear.

The edges of the roof of my house are rotted and I understand it is due to not having a metal "rake" edging. The rest of the roof appears sound. I believe my problem is to cut away the rotted roof and replace it, then install the rake edging. Would it be possible to just fit the edging over the rotten wood and hope for the best?

J. S. F., Hobbs, New Mexico.

A metal rake edging will not help. Your trouble is due to a lack of ventilation. You do not mention gutters, neither do you say whether the roof soffit is of the extended or flush type with only a fascia board over the wall. This forces us to guess, which we are reluctant to

If the soffit is of the extended type, then the soffit should be vented to provide air circulation. If otherwise, then the attic should be ventilated to remove moisture which tends to collect in unvented areas.

The lower roof board can be removed by lifting the lower double course of shingles. If the board is wide, two or three courses may have to be removed. This is a lengthy and rather tedious job, but if it is taken by stages it can be done without undue damage to the shingles. Or, you can have the work done by an experienced roofer. In any case, ventilation must be provided to prevent a recurrence of the trouble.

I know it's an unusual request, but do you know of a source for exotic butterflies? Would like to embed them in plastic, and use them in other ways for decoration. C. C. S., Great Falls, Mont.



Butterflies, as well as other insects, sea shells and fossil material can be purchased from Collectors Wonderland, P. O. Box 1170, New York 8, N. Y. We suggest you send for their catalogs and price lists.

Am trying to find a book of instructions that will give me, in simple terms, instructions on repairing old clocks, (not watches or jewelry). The library has books, but the terminology is over my head. I have written to clock manufacturers but they offer no help. C. B. K., Colorado Springs, Colo.

Write the National Association of Watch & Clock Collectors, Inc., Offices of Publication, 335 N. Third St., Columbia, Pa. for a listing of books on the subject of clock repair. The Association does not publish these books, but they will be able to list publishers of such works.

Can you tell me where I can buy dry shellac so I can cut it as needed? The liquid shellac deteriorates so rapidly. G. H. S., Pittsford, New York.

You can purchase dry shellac gum, but we don't recommend it simply because you will have the same problem of keeping the dry gum as the liquid. In fact, under average home conditions the dry gum will deteriorate faster than will the liquid, or cut, shellac kept in glass containers. However, if you wish to purchase the dry gum, it is available from Riemen-Kuhnert Co., 124 W. Grand Ave., Chicago 11.



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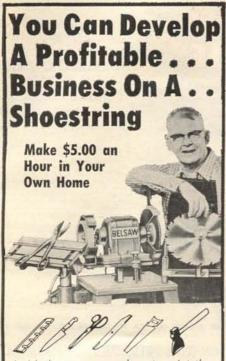
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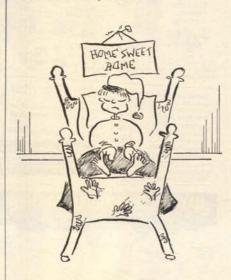
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We got the rage to finish an old iron bedstead in metallic gold. It looked beautiful for a few weeks, but then started to pick up fingerprints and we can find nothing that will remove them. Could we refinish with the gold paint, then cover it with shellac or varnish?

Mrs. J. W. W., Texas.



By your use of the term "metallic gold" we assume you used a preparation containing bronze pigment, that is, gilding paint. This is seldom satisfactory for the purpose and shows fingerprints, as you describe. It also soon loses its luster if handled. We would suggest repainting the bedstead, then applying a coat of clear plastic material or a quality varnish. This is done over an "antique" finish in which gold or silver metallics are used, and seems to work quite well.

We are building a new home and would like to include an indoor barbecue adjacent to the fireplace in the family room. The fireplace is to have a Heatilator unit. There is room for only one flue in the chimney. Can we vent this barbecue to the single flue, or would a separate exhaust-fan system be better?

Dr. R. L. B., South Dakota.

You do not give us sufficient in-

formation to answer your question

with any degree of certainty. Whether or not you can tie the vent from the barbecue into the fireplace flue depends on such factors as the size of the flue and the size of the fireplace. If both are fairly small, we would suggest the barbecue have its own hood and flue; this would operate satisfactorily under natural draft. That is, as-

this would operate satisfactorily under natural draft. That is, assuming other governing factors are normal. We would be doubtful about the fireplace used as a second vent, would first consider the ex-

haust fan setup you suggest.

Am moving into an apartment in a building that is all fireproof concrete construction and plan on having a small workshop in the apartment. My concern is to eliminate as much as possible the sound of my power tools—which includes a 9-in. metalworking lathe, a 10-in. bandsaw, a drill press, jig saw and table saw—so the noise does not bother other tenants in the building. What is the best way to do this? E. S. M., San Angelo, Tex.

The metal lathe and drill press would not ordinarily give any trouble due to noise being transmitted through the floor. The other tools are likely to be a problem. Actually, you cannot soundproof a room in a building constructed as you describe; it must be done at the time of construction. The only thing you can do is place the tools on blocks of cork or rubber insulating pads such as are used in factory installations. Cork blocks are easier to obtain and probably would be less expensive. The machines cannot be screwed or bolted to the floor, as this would transmit vibration and noise. The lighter ma-chines, such as the jig saw also might be placed on pads made by cutting rubber kneeling pads into squares about 4 x 4 in., and placing a square of 1/4-in. plywood above and below the rubber.

The walls in my basement are made of concrete block that have been painted several coats of cement paint. In heavy rains the walls show damp spots in some places and water leaks onto the floor. The mortar joints seem in good condition and the outside of the walls were coated with tar when the house was built. What can I do to stop the leaking?

F. G. F., Long Island, N. Y.

You mention "cement paints". Do you mean masonry waterproofer? Ordinarily, the waterproofing masonry paints will stop seepage through the blocks, but will not stop seepage through voids in the mortar joints. This undoubtedly is what is happening. We would check carefully to see where the leaks occur, then chip out the mortar at these points and use a hydraulic material such as Hydro-Plug to seal the leaks. The problem is that as the house settles and the mortar joints crack slightly, they break the seal of the waterproofer and water then can enter. For appearance, after you patch the leaking spots, you can repaint with a cementitious waterproofing paint.

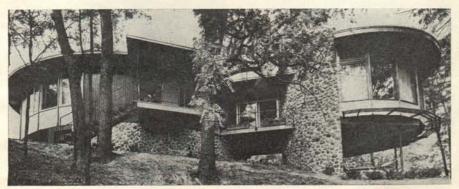


LIVING IN THE ROUND

Perhaps a forecast of homes of the future is this unusual and beautiful structure built by architect Orville Bauer on a rounded hilltop overlooking the picturesque Maumee River Valley in Toledo, Ohio. To make the view an integral and dramatic part of the design and decoration of his hilltop home, Mr. Bauer devised a plan of two circles with walls of glass that give the home an airy, spacious feeling in every room and untiring treetop beauty that changes with every season. The large circle is the main part of the house, and is in two levels. The living room, the only completely circular room in the house, is separated from the main structure and is supported on steel columns. The living room and main portion of the home are connected by an 8 x 8-ft. corridor

that provides access to both levels of the main part of the structure.

Because of the large areas filled by windows, double-glazed insulating glass is used throughout the home. This feature minimizes heat loss and condensation, and assures that the beautiful view is always visible. The design of the home has a functional, as well as esthetic appeal. The two-circle design took care of a difficult-site problem, while providing a home that is compact and extremely livable. The lower level of the main struclivable. ture has a large recreation room and an outdoor porch. This means that when guests are entertained. the children in their rooms upstairs are not bothered by the noise. A two-car garage in the lower level keeps the cars handy, yet well away from the living areas. \triangle \triangle



Circular home is perched gracefully atop a wooded knoll overlooking Maumee River Valley in Toledo, Ohio. House has lovely view from every room.

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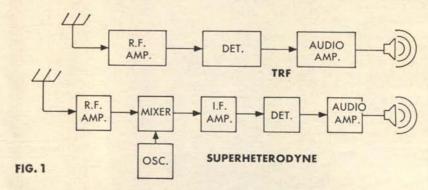
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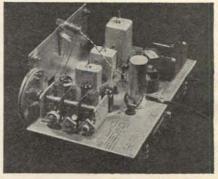
Even without test equipment, troubleshooting your home radio is not difficult if you use the professional approach. The first step is to isolate the trouble to one particular part of the radio, then locate which component in that part is causing the trouble. Replacing the component fixes the radio. Most radio troubles are caused by just one component, and 50 per cent of the time the faulty component is a tube.

Home radios are of two types: 1. Tuned Radio Frequency, (TRF), or 2. Superheterodyne, (superhet). The block diagrams in Fig. 1 show the difference between the two types. The TRF uses a tuned radio frequency amplifier to amplify the desired frequency directly, then deliver it to a detector. The detector changes the frequency to an audio signal to be amplified by the audio amplifier tube, then converted to sound waves by the speaker. The superhet takes the amplified frequency and converts it to a lower frequency called the intermediate frequency, (IF). Comparing the diagrams in Fig. 1 you will note that the superhet is a TRF with a converter, oscillator and IF amplifier added between the amplifier and detector. The oscillator "heterodynes" with the desired frequency in the converter tube to produce the intermediate frequency. The IF

is the difference between the oscillator and the desired frequency. Fig. 2 is a typical TRF radio, Fig. 3 is a typical superhet. The latter is easily recognized by the line of tall, rectangular "cans." These are IF transformers.

Excluding the cabinet and chassis, radios are combinations of four components: tubes, coils, resistors and capacitors. Tubes, Fig. 4, are glass or metal-enclosed elements that amplify weak signals by a valve-like action. Rectifier tubes change alternating current to direct current which is needed to operate the other tubes. Tubes are identified by numbers and letters, the number ahead of the letter indicating heater voltage. A 6SA7 tube has a 6-volt heater. A 12SA7 tube is identical, but requires 12 volts for its heater. Tube numbers beginning with 25, 35, 50 and 117 usually are power tubes. Thus, 35Z5 is a rectifier, 50L6 is an audio power tube to drive the speaker.

In the TRF shown a 12AU6 is the RF amplifier, a 12AV6 is the detector and the 50C5 and 35W4 the audio and rectifier tubes respectively. Adding the first numbers gives 109, close to household 110 volts. The heaters are operated in



 Superheterodyne, (superhet) type radio is readily recognizable by row of square "cans," that are coils.

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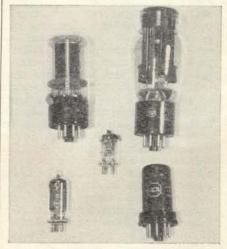
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series directly from the house current. The 35W4 rectifies the AC current to DC to operate the other tubes. As DC will operate this radio just as well as AC, it is called an AC-DC radio.

The superhet, Fig. 3, has a large power transformer at the rear of the chassis which cannot utilize DC, so this radio is AC only. A particular winding on this transformer supplies 6 volts AC for heaters, so all tubes in this superhet have numbers that start with 6. Another winding supplies high-voltage AC that is rectified to DC to power the tubes, as in the TRF. There are superhets that can be run on AC or DC. Their own in-ternal heaters, and heat inside the radio cabinet cause tubes to simply wear out. Their most common fault is an internal short. Tube testers can give you an idea of the condition of a tube, but replacing the suspected tube with a new one is the only completely accurate method of checking its condition.



4. Tubes come in various shapes and sizes, some have glass, others metal, envelope. Some have center guide.

Coils wound on various cores, and in different shapes do different jobs. These shapes vary from the transformer, upper left, Fig. 5 to the metal IF "can" at the lower right. Wound over an iron core a coil can deliver power from an AC wall outlet or from the radio to the speaker. The small transformer on the speaker matches the output of the audio tube to the voice coil of the speaker. The voice coil moves in a magnetic field and "drives" the speaker cone.

A coil connected to a variable capacitor makes it possible to tune in more than one station. IF transformers are two coils wound on one form, spaced to give the desired sharpness of tuning. Due to their construction coils usually "open-circuit"; if there is a short-

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5. Coils vary in shape from transformer at upper left, to metal IF "can" at lower right. Some are adjustable.

circuit between turns the coil usually burns out.

Resistors restrict the flow of electricity, adjusting voltages to suit various tubes and circuits. Resistors can be identified by their small cylindrical shape and their markings. Older resistors have a body-end-dot color coding; modern resistors, Fig. 6, have several colored bands near one end. Resistors rarely short, but do open-circuit and change value with age. Generally their value is not critical, a 20 per cent change being neither uncommon or serious in most circuits. If you suspect an open resistor, placing a good one across it should restore the circuit. The volume control is a variable resistor, a carbon-coated "horse collar" with a wiping contact as a variable tap. These often grow noisy due to dirt and to friction wearing away the carbon. Eventually the tap no longer contacts the carbon.

Capacitors, Fig. 7, once were called condensers, and are two metal plates or pieces of foil separated by an insulator. The area of the plates and the thickness of the insulator determine the capacity. Capacitors stop DC, but pass AC, allowing varying signals to pass from one tube to another. Variable capacitors, upper right, Fig. 7, can be identified by their parallel plates and air insulation. Your radio tuning dial rotates a variable capacitor. The others in Fig. 7 are fixed and have their ratings printed on them.

Now that you have an idea of the components that make up a radio let's list the usual radio troubles and their probable causes. The most common troubles are:

1. Radio is "dead."

2. Radio plays but sound is distorted.

3. Radio plays but has loud hum on stations.

4. Radio plays but has squeals, howls or "motorboating" sound.

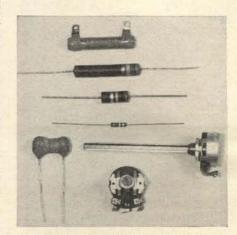
A radio chassis must always be removed from the cabinet, even if only to reach the tubes. First, unplug the set and disconnect any aerial or ground wires. Remove the back cover, keeping in mind that there may be a loop-type antenna on the inside of this cover. Fragile leads connect it to the set. Remove any screws holding the chassis in the cabinet and remove the knobs. Some slip off, others may have a setscrew. It may be necessary to remove the speaker also. Be careful not to damage the paper cone of the speaker.

When the chassis has been removed, check the cabinet and back cover for a schematic or tube-location chart. A schematic may not help if you are not familiar with them, but a tube chart definitely will help when you replace tubes. If there is no chart, make your own. Mark the location of each

tube and its number.

Replace the knobs for easier adjusting. If the set is completely "dead" remove all the tubes and check them at a tester. You can find them in drugstores, supermarkets and the like. Replace any that do not come up to standard. A radio that blows a fuse when the tubes are in place usually has a short on the DC high-voltage circuit. This means the rectifier tube is bad or the filter capacitors are shorted. If the fuse blows when the tubes are out of the sockets, then the short is either in the line cord or the power transformer.

When replacing tubes note that some have a keyed center post, others have only pins, with a wide space between two pins to locate it in the socket. When the tubes are all replaced, plug in the radio and turn it on. Remember there are relatively high voltages in a



6. Resistors restrict flow of electricity to adjust voltages on tubes and circuits. Most are of fixed value.

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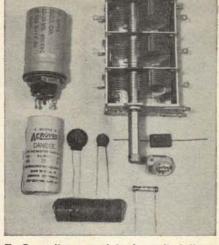
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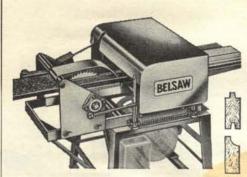
7. Capacitors used to be called "condensers," are metal plates or foil separated by an insulator. They pass AC.

radio, so keep your hands out of it. Also, the metal chassis of an AC-DC radio can be a shock hazard, as it is one side of the circuit. The chassis of a transformer-operated radio usually is not a hazard unless there is a short in the transformer

Make sure the tube heaters are lit after a few seconds of warm-up. If the radio has metal tubes, touch each to see that it is warm. If one or more heaters are dark, or if the metal tube is cold to the touch. quite likely there is an open solder joint near the socket connection. In an AC-DC radio the heaters are in series and one open heater or bad solder joint will turn off all the heaters. Unplug the radio and allow a few minutes for the tubes to cool. Examine the line cord carefully for cracks or breaks, and also the joint where it solders into the radio. It is possible the switch on the volume control is bad. This is particularly true if you know all tubes are okay and there is no open solder connection. However, be very sure the switch is bad before you remove it. Make an accurate drawing of how each wire connects to the control and the switch, then carefully unsolder each wire. If the volume control and on-off switch are one unit, buy separate units so any future replacements will involve only one of the units.

When you are looking for open circuits or loose wires, do not poke around in the radio with a finger. Make a probe from a 10-in. length of 1/4-in. dowel. Push and poke wiring and components with it. At the same time look for obvious signs of trouble. Overheating will be indicated by charred components or waxy deposits on chassis or cabinet. A tubular capacitor with a "bubbly" appearance, or discol-

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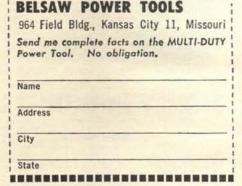
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oring quite possibly is bad. At any rate it has a short life and should be replaced. Greenish corrosion on leads near a component indicates that component is weakened. Pushing, poking and examining are basic practices in troubleshooting. If results are negative, the trouble usually must be run down with test equipment.

If the tubes light, but the radio is still dead, listen to the speaker to detect any hum or buzz. A buzz could indicate the rectifier tube is working but the trouble is somewhere else. If the elements in any of the tubes glow red they could be bad. Only the heaters in tubes should show any color. If the rectifier tube has glowing-red plates, most likely the filter capacitors are

Occasionally a tube will have a soft blue glow between the internal elements. This indicates a "gassy" tube and it must be replaced. A bright blue glow near the glass envelope, however, is normal and can be ignored.

Large electrolytic filter capacitors, lower left, Fig. 7, are often the first to fail because they are mounted near power tubes that generate much heat. The capacitors are identified by their size and the word "positive" indicating their polarity, or by their color-coded leads. The leads are red for positive and black for negative. Examine these capacitors for bulging or signs of corrosion. Next to tubes, these components are the most common cause of trouble.

Some radios have "double-end" tubes. There is a connector on the top which leads to the tube grid. Touching it (not with fingers, remember!), should cause a definite hum or other sound in the speaker. In a superhet, touching this ter-minal on an IF tube should allow stations to be heard. If so, the trouble is ahead of that particular tube. If not, then the trouble is either in the tube or in a later stage of the radio circuit.

Radios run cooler when out of the cabinet, and an intermittent shortcircuit or failure may not show. Use a high-wattage lamp or a heat lamp to heat the chassis when you are looking for an intermittent problem.

If a radio is dead and you replace a tube that then causes other symptoms, this is an indication that other components have caused one another to fail, and your troubleshooting will have to be started from scratch.

Distortion on a station usually is caused by a shorted coupling capacitor from the detector to the audio stages. In the TRF this capacitor would go from the 12AV6 to the 50C5. If visual examination of the 50C5 or the chassis around the tubes shows no obvious signs, then only test equipment will help find the trouble. Other causes of distortion are an off-center speaker coil or a bad speaker cone. With the radio turned off, press in gently on the speaker cone and let it out gently. If any scraping sound is heard, the speaker coil is dragging on the magnet and replacing the speaker cone is the only cure. Examine the cone for rips or torn spots. Minor rips can be repaired with adhesive tape; large ones require cone replacement.

Hum that is not affected by volume control usually is caused by bad filter capacitors. They probably have started to show excessive leakage and shunting a known good one across the suspected section should clear up the hum. If you replace the filter, make sure the new one is wired with correct polarity. Hum that is controllable by the volume control indicates an open resistor in the audio-output-tube circuit or a short in the audio tubes. Replacement of tubes or resistor will cure the problem. A "tuneable" hum that comes and goes with the station being tuned indicates the RF amplifier or the converter-oscillator tube is shorted internally.

Oscillations in the form of howls, squeals or a motorboating sound are almost always caused by bad capacitors, usually the filter capacitors. By-pass capacitors also could cause the trouble. These capacitors go from a tube terminal to a chassis ground. They act as AC shorts to keep unwanted AC signals from affecting tube per-formance. If one open-circuits it no longer is effective and the "feedback" of AC causes the howls, etc.

A good vacuuming or blowing-out of a radio often eliminates unusual, and unwanted, noises. If you hear noise only when the volume control is moved, then it should be replaced. If a radio makes a noise when you move or tap it, there is either a loose connection or a "microphonic" tube. That is, a tube sensitive to mechanical shock. Rapping the tubes with a 1/4-in. dowel usually will disclose the culprit.

If you have rapped, probed, fiddled and tinkered and still haven't fixed the radio, it's time to stop and take it to a serviceman. Unless, that is, you have test equipment and know how to use it. Even then, you would need a schematic and know how to read it. Schematics for various radios can be purchased from radio-supply houses, and these schematics usually give the values a tester should show at every point in a circuit. \triangle \triangle



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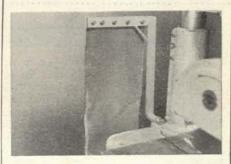
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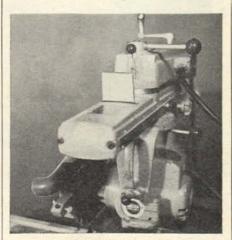
Here are three ideas to add to the usefulness of the versatile radialarm saw. One is a simple dust shield, one is a "table extender," the other a handy reference guide. You can use all, or just one.



"Sawdust stopper" is piece of canvas on light angle-steel frame. Box under the stopper will catch most sawdust.



If you do not have an auxiliary table, take out one of the removable table boards, replace it with a long strip.



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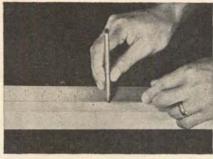
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DeCristoforo, Los Altos, Calif.

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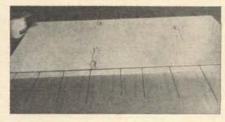
Rustic Lawn Chair



Two old buggy wheels were cut in half to provide the sides and arms of this unique lawn chair. The seat is bolted to lengths of 1/2-in. pipe that, in turn, are bolted to the wheel spokes.

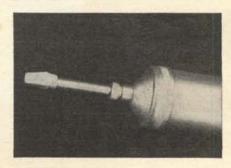
G. Brinkman, Okawville, Ill.

Applying Plastic Laminate



While a "slip sheet" of newspaper or wrapping paper is generally used between plastic laminate and contact adhesive to position the laminate, I have found a better method. The slip sheet sometimes sticks and tears, so I use is-in. gas-welding rods as shown. After the laminate is positioned you pull out the rods one at a time and press the laminate against the adhesive. C. Wayne Close, Glendale, Ore.

Seal Calking Gun



When a calking gun is set aside before the material in a cartridge is completely used, seal the nozzle so the material does not harden. To do this, clean the nozzle tip, then cap it with a slip-on pencil eraser as shown.

Epoxy "Locknut"



An off-beat use I have found for the new epoxy adhesives is to lock a nut on a bolt to prevent it loosening from vibration. The epoxy used here contains a filler and is used for auto-body repair work. It is available at most hardware stores as well as auto-supply outlets.

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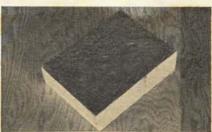
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Small-Tool Hangers



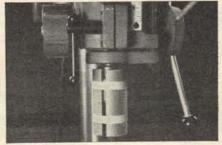
I utilize the inside surfaces of my shop cabinets to store accessories for power tools. Ordinary pictureframe hooks (the type nailed to the wall), in various sizes, work fine for any item that has an opening in it.

Metallic Wood Finishes



Modern epoxy adhesives that contain a metal filler are ideal for putting a metallic finish on a wood surface. Rough-up the wood with coarse sandpaper and apply the epoxy with a spatula or putty knife. The material can be smoothed or worked to resemble "stucco", depending on your own requirements. The idea is especially suitable for small projects such as jewelry, and cigarette boxes and picture frames.

Chuck Protection



A drill-press chuck is a precision tool and should be protected against abuse, dirt and dust. An easy way to do this is to slit a heavy mailing tube so it is slightly less than the diameter of the chuck. Strips of tape hold the cut edges together so the protective tube is a force-fit over the chuck. Before using the cover, let some oil soak into the cardboard so it provides a rustproofing.

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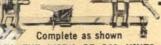
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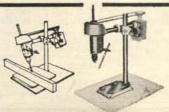
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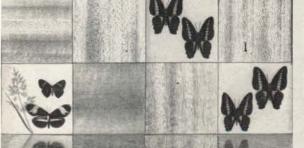
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